Department of Agriculture

Forest Service

Southwestern Region

Wildlife Specialist Report –

Biological Evaluation For Sensitive Species

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Forest Plan Revision FEIS

Apache-Sitgreaves National Forests (ASNFs)

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Introduction

To comply with the National Forest Management Act, the Apache-Sitgreaves National Forests (hereafter, ASNFs) propose to revise the current land management plan (1987 forest plan). A final environmental impact statement (FEIS) has been prepared that analyzes four alternatives developed for the programmatic management of the 2.1 million acres administered by the ASNFs. The selected alternative would guide all management and activities on the ASNFs for the next 15 years.

In support of the FEIS, four Wildlife Specialist Reports (WSRs) have been prepared that address terrestrial and non-fish aquatic wildlife.[1] These four reports cover the following: 1) species viability, management indicator species, and other indicators; 2) federally-listed Endangered Species Act species; 3) migratory birds, bald eagles, and important bird areas; and 4) this report (i.e., the biological evaluation), covering Regional Forester-designated sensitive species. These WSRs provide the means to compare and evaluate four plan alternatives which are: continuation of the current 1987 Forest plan or alternative A, and three other plan revision or action alternatives (alternatives B, C, and D).

The purpose of this report is to determine potential effects on Regional Forester-designated sensitive species from management and activities as a consequence of implementation of any of the four plan alternatives. It fulfills the requirements for a "biological evaluation" of sensitive species in compliance with Forest Service Manual 2670.32(2). This document references and incorporates information from the Wildlife Specialist Report - Viability (Forest Service 2014a); hereafter WSR-V. Given the programmatic nature of a forest plan and the landscape-wide scale of analysis, findings in this report are not a substitute for site specific analyses.

Relevant Laws, Regulations, and Policy

Forest Service Manual (FSM) provides direction for the management of wildlife, fish, and rare plants on National Forest Service (NFS) lands; specifically these are threatened, endangered, sensitive and other identified plants and animals. Sensitive species are defined as "those plant and animal species identified by the Regional Forester for which population viability is a concern, as evidenced by a 1) significant current or predicted downward trends in population numbers or density, or 2) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution" (FSM 2670.5).

A primary objective of Forest Service policy is to develop and implement management practices to ensure that species do not become threatened or endangered due to Forest Service actions (FSM 2670.32). Key components to ensure this are:

1) Assist states in achieving their goals for conservation of endemic species,
2) As part of the National Environmental Policy Act process, review programs and activities, through a biological evaluation, to determine their potential effect on sensitive species,
3) Avoid or minimize impacts to species, whose viability has been identified as a concern,
4) If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole, but the decision must not result in loss of species viability or create significant trends toward federal listing, and
5) Establish management objectives in cooperation with the state when projects on NFS lands may have a significant effect on sensitive species population numbers or distributions.

[1] Fish species are addressed in the separate Fisheries Specialist Report.

Methodology and Analysis Process

Species considered

The first Regional Forester's sensitive species lists (one list each for animals and plants) evaluated for this report was transmitted to Forest Supervisors in 2007 and the latest sensitive species lists were transmitted in 2011. Sensitive, along with other, species were evaluated during the plan revision process as "forest planning species" or FPS, i.e., species for which there may be a concern regarding viability (Forest Service, 2008b and 2009). That evaluation was later updated (Forest Service, 2012). Therefore, the analysis process for sensitive species in this biological evaluation follows closely to that for FPS in the WSR-V document.

In total, the Regional Forester has identified 63 sensitive species for the ASNFs, consisting of mammals, birds, reptiles, amphibians, invertebrates, and plants.[2] A number of sensitive species on the 2007 Regional Forester's lists were not included in the 2011 lists; however, most have been retained for analysis in this biological evaluation because they are still identified FPS. Conversely, some of the 63 sensitive species were not carried forward into this report for various reasons; appendix A shows these species with rationale. Therefore, this wildlife specialist report addresses 53 Regional Forester sensitive species and it comprises the *biological evaluation* as required by FSM 2670.32, item 2) above.

Species and habitat existing condition
Species-habitat link
Management effects
Viability consequences

See the same titled sections in the WSR-V for the description of how these are determined for all FPS, which includes sensitive species.

Assumptions and Alternatives

Description of the four plan alternatives are found in the Programmatic Final Impact Statement for the ASNFs Land Management Plan. Assumptions relevant to wildlife analyses for forest plan revision are found in the WSR-V.

Description of Affected Environment (Existing Condition)

Sensitive species and habitat existing condition

Table 1 lists the 53 sensitive species that are analyzed in this biological evaluation. The table identifies the species' condition relative to current abundance and distribution on the ASNFs, i.e., their "F ranking". It also identifies the PNVT habitat and/or primary habitat element(s) for each that is of the most importance relative to impacts from forest plan management and activities and of importance regarding risk to species viability. Note that information in Tables 1, 2, 3, and 4 is taken from the WSR-V which provides more details on species' abundance, distribution, and F ranking on the ASNFs.

[2] There are six Regional Forester sensitive fish species but these are addressed separately in the Fisheries Specialist Report.

Table 1. Sensitive species, their status, existing condition, and associated PNVT or habitat Element(s)

Sensitive species		Status [a/]	F ranking [b/]	PNVT or habitat element
[a/] S = sensitive; any other additional status is footnoted [b/] F ranking (existing condition relative to abundance and distribution): F? = insufficient indications to estimate; F1 = extremely rare; F2 = rare; F3 = uncommon (including locally common but in rare locations); F4 = widespread; F5 = secure				
Mammals (18)				
Clethrionomys (Myodes) gapperi	southern red-backed vole	S	F?	down debris (plant and needle litter)
Corynorhinus townsendii pallenscens	Townsend's big-eared bat	S	F?	ponderosa pine Madrean pine-oak woodland
Cynomys gunnisoni	Gunnison's prairie dog	S [1/]	F1	Great Basin grassland intentional harassment
Euderma maculatum	spotted bat	S	F?	cliffs wet meadow
Eumops perotis californicus	greater western mastiff bat	S	F?	semi-desert grassland montane/subalpine grassland
Idionycteris phyllotis	Allen's big-eared bat	S	F?	snags
Lasiurus blossevillii	western red bat	S	F?	down debris (leaf litter)
Microtus longicaudus	long-tailed vole	S	F3	wet swales (Montane/Subalpine grassland)
Microtus montanus arizonensis	Arizona montane vole	S	F3	riparian wet meadow
Microtus mogollonensis mogollonensis	Mogollon vole	S	F3	montane/subalpine grassland Great Basin grassland meadow
Perognathus flavus goodpasteri	Springerville pocket mouse	S	F3	Great Basin grassland
Sciurus arizonensis arizonensis	Arizona gray squirrel	S	F?	snags, large trees
Sorex merriami	Merriam's shrew	S	F3	ponderosa pine dry mixed conifer wet meadow
Sorex nana	dwarf shrew	S	F3	montane/subalpine grassland talus/rocky
Sorex palustris navigator	water shrew	S	F?	water, riparian
Spermophilus tridecemlineatus monticola	White Mountains ground squirrel	S	F3	montane/subalpine grassland Great Basin grassland
(Neo)Tamias minimus arizonensis	White Mountain chipmunk	S	F?	wet mixed conifer spruce-fir
Zapus hudsonius luteus	New Mexico meadow jumping mouse	S [2/]	F1	water, riparian (no compaction)
Birds (9)				
Accipiter gentilis	northern goshawk	S [3/]	F4	ponderosa pine dry mixed conifer large trees
Athene cunicularia hypugaea	western burrowing owl	S	F?	Great Basin grassland
Buteo albonotatus	zone-tailed hawk	S	F3	large trees
Buteogallus anthracinus	common black-hawk	S	F4	large trees
Coccyzus americanus occidentalis	western yellow-billed cuckoo	S [2/]	F1	riparian, mid canopy
Dumetella carolinensi	gray catbird	S	F3	low-mid canopy riparian
Falco peregrinus anatum	peregrine falcon	S	F3	cliffs, riparian

Sensitive species		Status [a/]	F ranking [b/]	PNVT or habitat element
[a/] S = sensitive; any other additional status is footnoted [b/] F ranking (existing condition relative to abundance and distribution): F? = insufficient indications to estimate; F1 = extremely rare; F2 = rare; F3 = uncommon (including locally common but in rare locations); F4 = widespread; F5 = secure				
Haliaeetus leucocephalus	bald eagle	S	F2	water, large trees
Vireo vicinior	gray vireo	S	F?	Madrean pine-oak woodland low-mid canopy nest parasitism
Amphibians/Reptiles (5)				
Bufo microscaphus	Arizona toad	S	F4	water, riparian
Lithobates pipiens	northern leopard frog	S	F1	water, disease
Lithobates yavapaiensis	lowland leopard frog	S	F3	water, disease
Thamnophis eques megalops	northern Mexican gartersnake	S [2/]	F?	water, riparian
Thamnophis rufipunctatus	narrow-headed gartersnake	S [2/]	F1	water, riparian
Invertebrates (6)				
Anodonta californiensis	California floater	S	F1	water
Lycaena ferrisi	Ferris' copper butterfly	S	F3	meadow
Ophiogomphus arizonicus	Arizona snaketail dragonfly	S	F?	water
Piruna polingii	four-spotted skipperling butterfly	S	F3	meadow
Speyeria nokomis nitocris	nitocris fritillary butterfly	S	F3	wet meadow, collection
Speyeria nokomis nokomis	nanomis fritillary butterfly	S	F3	wet meadow, collection
Plants (15)				
Allium gooddingii	Goodding's onion	S	F3	dry & wet mixed conifer spruce-fir (cool micro-climate)
Asclepias uncialis spp. *uncialis*	Greene milkweed	S	F?	Great Basin grassland semi-desert grassland
Castilleja mogollonica (also *C. sulpurea*)	White Mountains paintbrush	S	F1	wet meadow
Cypripedium parviflorum var. *pubescens*	yellow lady's slipper	S	F1	wet mixed conifer spruce-fir collection
Helenium arizonicum	Arizona sneezeweed	S	F2	wet meadow
Helianthus arizonensis	Arizona sunflower	S	F?	semi-desert grassland
Heuchera eastwoodiae	Eastwood alumroot	S	F?	canyon slopes (cool micro-climate)
Heuchera glomerulata	Arizona alumroot	S	F3	canyon slopes (cool micro-climate)
Packera cardamine	heartleaf (bittercress) ragwort	S	F?	wet mixed conifer spruce-fir shaded meadow
Pteryxia davidsonii	Davidson's cliff carrot	S	F?	Madrean pine-oak woodland
Puccinellia parishii	Parish's alkali grass	S	F1	wet (alkali) meadow
Rumex orthoneurus	Blumer's dock	S	F3	water, riparian
Salix arizonica	Arizona willow	S	F1	riparian
Salix bebbiana	Bebbs willow	S	F3	wet meadow
Trifolium neurophyllum	Mogollon clover	S	F3	ponderosa pine shaded or wet meadow
[1/] Indicates a species also analyzed as a Highly Interactive species; see the Wildlife Specialist Report -Viability. [2/] Indicates a species being considered for listing under the Endangered Species Act. [3/] Indicates a species also analyzed as a forest Management Indicator Species; see the Wildlife Specialist Report -Viability.				

Table 2 groups the above sensitive species by PNVT and habitat element(s) in order to facilitate analysis of risk to viability for these species. There are 18 habitat elements in three groupings in this table.

Table 2. Sensitive species grouped by PNVT or habitat element(s) relative to species viability risk

PNVT or habitat element	Sensitive species
PNVTs (8)	
Ponderosa Pine Forest	Townsend's big-eared bat, northern goshawk, Mogollon clover
Dry Mixed Conifer Forest	Gooddings onion
Wet Mixed Conifer Forest	Gooddings onion, yellow lady's slipper, heartleaf ragwort
Spruce-Fir Forest	Gooddings onion, yellow lady's slipper, heartleaf ragwort
Madrean Pine-Oak Woodland	Townsend's big-eared bat, Davidson's cliff carrot
Montane/Subalpine Grassland	Long-tailed vole, Mogollon vole, dwarf shrew, White Mountains ground squirrel
Great Basin Grassland	Gunnison's prairie dog, Mogollon vole, Springerville pocket mouse, White Mountains ground squirrel, western burrowing owl, Greene milkweed
Semi-desert Grassland	greater western mastiff bat, Greene milkweed, Arizona sunflower
Habitat component elements (7)	
High water quality and/or healthy riparian conditions	Arizona montane vole, water shrew, NM meadow jumping mouse, common black-hawk, yellow-billed cuckoo, Arizona toad, northern leopard frog, lowland leopard frog, northern Mexican gartersnake, narrow-headed gartersnake, California floater, Arizona snaketail dragonfly
Sometimes shaded or often wet meadows	Merriam's shrew, spotted bat, Arizona montane vole, Ferris' copper butterfly, four-spotted skipperling butterfly, nitocris fritillary butterfly, nanomis fritillary butterfly, White Mountains paintbrush, Arizona sneezeweed, heartleaf ragwort, Parish alkali grass, Bebbs willow
Dense low or mid canopy or shrubs	gray catbird, gray vireo, Goodding's onion, Eastwood alumroot, Arizona alumroot
Large trees and/or dense upper canopy	Arizona gray squirrel, zone-tailed hawk, common black-hawk, western yellow-billed cuckoo
Snags	Allen's big-eared bat, Arizona gray squirrel
Down wood or debris	southern red-backed vole, western red bat, gray catbird
Canyon slopes, cliffs, talus or rocky slopes	Townsend's big-eared, spotted bat, Eastwood alumroot, Arizona alumroot
Other habitat related elements (3)	
Collection or loss from management	nitocris fritillary butterfly, nanomis fritillary butterfly, yellow lady's slipper, hooded lady's tress
Impacts from parasitism, disease, entrapment, and predation or competition from invasive species	e.g., nest parasitism by cowbirds as affected by grazing management; aquatic and terrestrial disease as spread by recreation or grazing activities; unsustainable predation or habitat competition from invasive species such as crayfish; small mammal entrapment in troughs, etc.
Intentional harassment, forced removal, or avoidable disturbance	Gunnison's prairie dog, many FPS (at least during important life cycle periods)

The following two tables reflect current habitat provided on the ASNFs. Table 3 shows the existing condition and acreage of all 14 PNVTs on the ASNFs that may provide habitat for sensitive species. PNVT condition is characterized as departure from desired conditions and, for context, historic conditions.[3]

Table 4 describes two groups of habitat elements currently influencing sensitive species on the ASNFs. Their existing conditions are widely variable as described in the Ecological Sustainability Report (Forest Service, 2008a) and no acreage figures or other assessment of amounts are available for the other habitat elements on a forest-wide basis.

[3] Historic conditions for vegetation (PNVTs), also called historic range of variability or reference conditions, were provided by The Nature Conservancy. For more information, see the Vegetation Specialist Report (Forest Service, 2014b).

Table 3. Existing condition of PNVTs providing habitat for sensitive species on the ASNFs: acreage and comparison to historic conditions (HC) and desired conditions (DC)

PNVT abbreviation	PNVT (vegetation type) and acreage	Existing Condition (EC) with Comparisons		Comments
		EC % departure from HC & class [a/]	EC % departure from DC & class [a/]	NFS lands total 2,015,352 acres without private or state in-holdings
	Departure ratings classes: 0-20%= no or little departed; 21-40%= low departure; 41-60%= moderate; 61-80%= high; 81-100=severe			NFS = national forest system
Forest types - 945,753 acres & 47% of NFS Land				
PP	Ponderosa Pine Forest, about ⅓ has Gambel oak component 602,206 ac	94%, severe	77%, high	DC includes some current vegetation states now utilized by northern goshawk, i.e., large-very large trees with closed canopies that were not common historically
DMC	Dry Mixed Conifer Forest (frequent fire mixed conifer) 147,885 ac	77%, high	67%, high	DC includes some current vegetation states now utilized by Mexican spotted owl, i.e., large-very large trees with closed canopies and multi-storied that were not common historically
WMC	Wet Mixed Conifer Forest (infrequent fire mixed conifer)--can include aspen component 177,996 ac	61%, high	54%, mod	Increased canopy and representation of shade intolerant connivers, especially in the low to mid layers.
SF	Spruce-Fir Forest--includes a mix of other conifers & can include an aspen component 17,667 ac	62%, high	59%, mod	Lower elevation than pure spruce- fir types; still typically a stand replacement fire type--partially incorporated into DC
Woodland types – 617,093 acres & 31% of NFS Land				
MPOW	Madrean Pine-oak Woodland 394,927 ac	72%, high	61%, high	Higher density (trees/acre) than historically or desired
PJW [b/]	Piñon-Juniper woodland 222,166 ac	28%, low	28%, low	Much higher density (trees/acre) than historically or desired
Grassland types – 344,034 acres & 17% of NFS Land				
MSG	Montane/Subalpine Grassland 51,559 ac	54%, mod	54%, mod	Compositional shift in grasses and forbs has occurred, some conifer encroachment
GBG	Great Basin Grassland 185,523 ac	67%, high	67%, high	Extensive encroachment by conifers
SDG	Semi-Desert Grassland 106,952 ac	79%, high	79%, high	Widespread encroachment by conifers
Riparian types – 48,241 acres & 2% of NFS Land				
WCR	Wetland-Cienega Riparian Area 17,900 ac	36%, low	36%, low	Compositional shift from dominance by sedges and other native grasses to non-native bluegrasses and some encroachment by conifers; more bare ground than historically
MWR	Montane-Willow Riparian Forest 4,808 ac	21%, low	21%, low	Compositional shift from dominance by sedges and other native grasses to non-native bluegrasses and some encroachment by conifers
CWR	Cottonwood-Willow Riparian Forest 15,876 ac	20%, not departed	20%, not departed	Limited trees in young age classes due to ungulate grazing and reduced bank stability in some areas
MBDR	Mixed Broad-leaf Deciduous Riparian Forest 9,657 ac	33%, low	33%, low	Under representation of large trees, increased density in lower canopies; less streambank stability
Shrubland – 55,981 acres & 3% of NFS Land				

IC [b/]	Interior Chaparral 55,981 ac	8%, no departure	8%, no departure	Converts to grassland with fire, rapidly returning to chaparral within 3-4 years

[a/] Note that desired conditions, while similar, are not identical to historic conditions because complete return to historic conditions may not be desirable or attainable after over 120 years of Euro-American settlement.
[b/] Indicates a PNVT that none of the sensitive species are associated with.

Table 4. Habitat elements and habitat related elements influencing sensitive species on the ASNFs

Habitat elements	Description [a/]
Habitat component elements (7)	
High water quality and/or healthy riparian conditions	yearlong or nearly yearlong presence of adequate amounts of water and/or saturated soils; dense, tall herbaceous riparian vegetation, with or without riparian trees; no soil compaction
Sometimes shaded or often wet meadows	shaded areas in openings among trees or open wet meadows (cool micro-climate); extensive ground cover present and soils are little to not compacted
Dense low or mid canopy or shrubs	density of vegetation cover at the shrub or low canopy level, often with cool micro-climate
Large trees and/or dense upper canopy	generally, > 16" dbh (diameter at breast height) and often with closed canopies (generally >60% canopy closure)
Snags	large (>12" dbh, generally >16" dbh), provided by both dying and long dead trees
Down wood or debris	logs (12" plus) or small woody material or leaf/needle litter on the forest floor usually shaded by overstory trees
Canyon slopes, cliffs, talus or rocky slopes	cliffs or cool, shaded canyon slopes usually associated with riparian areas or riparian forests, or areas dominated by rocks often with some slope
Other habitat related elements (4)	
Habitat connectivity	connectivity of suitable habitat for travel or movement among needed habitat types or habitat components
Collection or loss from management	removal or loss of rare or uncommon species, most often plants, but also animals or invertebrates
Impacts from parasitism, disease, entrapment, and predation or competition from invasive species	e.g., nest parasitism by cowbirds as affected by grazing management; aquatic and terrestrial disease as spread by recreation or grazing activities; unsustainable predation or habitat competition from invasive species such as crayfish; small mammal entrapment in troughs, etc.
Intentional harassment, forced removal, or avoidable disturbance	resulting in disturbance to important life function (e.g., feeding young) or in removal or death

[a/] As the description shows, each covers a variety of specific situations; these groupings are to facilitate analysis of viability risk for sensitive species.

Environmental Consequences for Sensitive Species

Because a land management plan does not authorize or mandate any site-specific projects or activities (including ground-disturbing actions) there can be no direct effects. However, there may be implications, or longer term environmental consequences, of managing the forests under a programmatic framework. In addition, short term implementation impacts may occur as a consequence of management or activities which have the overall goal of moving habitat toward desired conditions.

Sensitive species are designated due to concerns about trends in population or habitat capability, i.e., concern about risk to their viability (FSM 2670.22). As such, two determinations are made for each sensitive species in this biological evaluation: 1) a determination of impacts to individuals of the species and 2) a determination about loss of viability and trend toward federal listing for the species as a whole (FSM 2670.44(5)). Based on the analysis in the WSR-V (Forest Service 2014a), the four ASNFs plan

alternatives provide for viability of all FPS, including sensitive species, to varying levels of effectiveness. This analysis included evaluating viability risk ratings for each (sensitive) species through a coarse filter and a fine filter approach. The former includes habitat conditions addressed by plan components that are PNVT desired conditions. Where habitat needs or management impacts are not fully addressed by coarse filter desired conditions, fine filter plan components such as standards and/or guidelines are used to further address sensitive (and other) species needs.

Sensitive Species Findings

Some key plan components that help meet the needs of sensitive species are in the following sections that show consequences to sensitive species. Additional plan components that also help meet the needs of sensitive and other species are found in appendix B which contains desired conditions, and appendix C contains more information on how individual species' needs are met by various other plan components. Table 5 shows where coarse and fine filter components needed by various sensitive species are found in the land management plan.

Table 5. Sections of the plan containing plan components that address sensitive species at the coarse and fine filter levels

Viability/Plan Components>	Coarse Filter	Fine Filter	
	Desired Conditions (DC)	Standards (ST)	Guidelines (GL)
Coarse filter plan decisions that provide viability for:			
All Sensitive Species	Riparian Areas, All PNVTs, Ponderosa Pine, Dry Mixed Conifer, Wet Mixed Conifer, Piñon-Juniper, Madrean Pine-Oak, Grasslands, Interior Chaparral		
Fine filter plan decisions that are in addition to the coarse filter plan decisions above that provide viability for:			
Ponderosa Pine Forest Sensitive Species (Mogollon vole, Merriam's shrew, four-spotted skipperling butterfly, Arizona sneezeweed, Mogollon clover)			Ponderosa Pine, Wildlife and Rare Plants
Dry Mixed Conifer Forest Sensitive Species (Goodding's onion, Merriam's shrew)			Dry Mixed Conifer, Wildlife and Rare Plants
Wet Mixed Conifer Forest Sensitive Species (White Mountains chipmunk, southern red-backed vole)			Soil, Wildlife and Rare Plants
Madrean Pine-Oak Woodland Sensitive Species (Greene milkweed)			All PNVTs, Wildlife and Rare Plants
Montane/Subalpine Grasslands Sensitive Species (Ferris' copper butterfly, nitocris and nakomis fritillary butterflies, dwarf shrew, long-tailed vole, White Mountains ground squirrel)			All PNVTs, Wildlife and Rare Plants
Great Basin Grassland Sensitive Species (Springerville pocket mouse, White Mountains ground squirrel, Greene milkweed, Parish alkali grass)			All PNVTs, Wildlife and Rare Plants

Viability/Plan Components>	Coarse Filter	Fine Filter	
	Desired Conditions (DC)	Standards (ST)	Guidelines (GL)
High Water Quality Sensitive Species (water shrew, bald eagle, northern leopard frog, northern Mexican gartersnake, narrow-headed gartersnake, California floater)			Water Resources, Riparian Areas, Wildlife and Rare Plants, Wild Horse Territory MA
Unique Habitat Sensitive Species - Healthy Riparian Conditions (water shrew, New Mexico meadow jumping mouse, northern Mexican gartersnake, narrow-headed gartersnake, Arizona willow, Bebbs willow)		Dispersed Recreation	Water Resources, Aquatic Habitat and Species, Riparian Areas, Wildlife and Rare Plants, Livestock Grazing
Unique Habitat Sensitive Species - Large Trees/Snags, Dense Canopies (Allen's big-eared bat, bald eagle, western yellow-billed cuckoo)			Wildlife and Rare Plants
Unique Habitat Sensitive Species - Dense Low-Mid Canopy with Ample Ground Litter (western red bat)		Dispersed Recreation	Wildlife and Rare Plants, Motorized Opportunities
Unique Habitat Sensitive Species - Permanent Wet Meadow-Like Areas (Ferris' copper butterfly, nitocris fritillary butterfly, nokomis fritillary butterfly)			Wildlife and Rare Plants

Consequences to Coarse Filter Sensitive Species

Sensitive Species Across All Habitats

The following 24 sensitive species grouped below have essentially no risk to viability from any of the alternatives because desired conditions for their associated PNVT would meet their needs. Modeling has shown all alternatives move habitat toward those conditions at 15 years, regardless of the relative management effect rating for each alternative[4]. In addition, most alternatives continue toward desired conditions at 50 years; alternative C is the primary exception. See the WSR-V for this information.

While there may be some impact to individual sensitive species from implementation of any of the plan alternatives, there would be no trend toward Federal listing for the following 24 sensitive species during the 15-year plan period under **all alternatives**:

> Townsend's big-eared bat, spotted bat, greater western mastiff bat, Arizona montane vole, Arizona gray squirrel, red squirrel, northern goshawk, zone-tailed hawk, common black-hawk, yellow-billed cuckoo, gray catbird, peregrine falcon, gray vireo, Arizona toad, lowland leopard frog, Arizona snaketail dragonfly, White Mountains paintbrush, Arizona sunflower, Eastwood alumroot, Arizona alumroot, heartleaf ragwort, Davidson's cliff carrot, Blumer's dock, and carnivorous bladderwort.

[4] Table 7 in the WSR-V (Forest Service 2014a) contains descriptions of three levels of management effect (ME); each alternative's ME outcome (WSR-V table 19) is based on how the alternative's objectives move habitat toward desired conditions as relatively compared with the other alternatives.

Consequences to Fine Filter Sensitive Species

Viability for the remaining 29 sensitive species is assessed based on the management effect rating for each alternative and the individual species viability risk rating, both of which are taken from the WSR-V analysis. In order to compare *viability effectiveness* among alternatives for each sensitive species, the viability risk rating (VRR) outcome for each sensitive species is combined with each alternative's management effect (ME) outcome. The comparison requires converting ME values and VRR values into a common descriptor so they can be combined as described below.

Management effects outcomes are converted as follows and are used in the subsequent consequences to sensitive species sections (the greater the number of +'s, the more effective the alternative is for sensitive species viability):

ME of 1 converts to "+++"; ME 2 converts to "++"; and ME 3 converts to "+"

Viability risk rating outcomes (VRR) are converted as described in table 6 and are used in the subsequent consequences to sensitive species sections (the greater the number of +'s, the less risk and the more effective the alternative provides for sensitive species viability). Viability risk ratings are L (low), M (moderate), H (high), and VH (very high); see the WSR-V for more details.

Ratings of L or M are shown as "+++" because risks here are considered no more substantial than normal ecosystem fluctuations where species normally persist. No sensitive species have a rating of VH where there is the most risk to species viability. Otherwise, ratings of MH are shown as "++" and ratings of H are shown as "+". This is because a rating of MH has less risk and therefore better supports species viability than a rating of H.

Table 6. Viability risk ratings (VRRs) for sensitive species described and converted

Risk Levels	Species Persistence	Viability	Levels of Viability Effectiveness
Normal ecosystem fluctuations →	Species able to persistence →	Yes	(Natural level of impact)
VRRs of L and M →	Species able to adjust and persistence because risk is similar to normal ecosystem fluctuations based primarily on PNVT desired conditions (coarse filter) →	Yes →	L or M = +++
VRRs of MH, H, VH →	Species persists based on desired conditions along with standards and guidelines (fine filter) →	Yes (alternatives providing viability at various effectiveness levels for comparison of alternatives) →	Viability effectiveness: MH = ++ best H = + next best VH = (no occurrences)

Ponderosa Pine Forest (PPF) PNVT - Sensitive Species

Mogollon vole, Merriam's shrew, four-spotted skipperling butterfly, Arizona sneezeweed, Mogollon clover

These five sensitive species have a fine filter habitat need of sometimes shaded or often wet meadow or forest openings. These conditions provide insect and invertebrate prey for the vole and shrew, moister conditions for nectaring for the butterfly, and cooler growing conditions for the two plants. Desired conditions for this PNVT address openings and meadows; however, an additional plan component is included to ensure their needs are met[5]:

- Ponderosa Pine GL – Where consistent with project or activity objectives, canopy cover should be retained on the south and southwest sides of small, existing forest openings that are naturally cooler and moister. These small (generally one-tenth to one-quarter acre) shaded openings provide habitat conditions needed by small mammals, plants, and insects (e.g., Merriam's shrew, Mogollon clover, four-spotted skipperling butterfly). Where these openings naturally occur across a project area, these conditions should be maintained on an average of two or more such openings per 100 acres.
- Wildlife and Rare Plants GL – Management and activities should not contribute to a trend toward the Federal listing of a species.

Table 7 compares the viability effectiveness of the alternatives. **Alternatives B and D** would have the greatest viability effectiveness for these PPF, followed by **alternative C**, then **alternative A**.

Individuals of these five species may be impacted by implementation of any of the alternatives, which may be more likely under alternative A with its lower overall viability effectiveness (13) as compared to the other action alternatives (21, 16, 21 respectively for alternatives B, C, and D). However, none of the alternatives would lead to a trend toward Federal listing. This is because alternative objectives (see table 3) are expected to move habitat toward desired conditions (see the "Vegetation" section) and the guidelines above additionally provides for these species' needs.

Table 7. Viability effectiveness for sensitive species associated with PPF

Sensitive FPS		Viability Effectiveness (coarse and fine filter)			
		Alt. A	Alt. B	Alt. C	Alt. D
Fine Filter	Mogollon vole	+ + +	+ + +	+ +	+ + +
	Merriam's shrew	+ +	+ + +	+ + +	+ + +
	Four-spotted skipperling butterfly	+ + +	+ + +	+ +	+ + +
	Arizona sneezeweed	+	+ + +	+ + +	+ + +
	Mogollon clover	+ +	+ + +	+ + +	+ + +
Coarse filter - ME		+ +	+ + +	+ + +	+ + +
Total effectiveness +'s		13	21	16	21

[5] See the Final Land Management Plan for any minor adjustments in plan components noted here and in all subsequent sections of this report.

Dry Mixed Conifer Forest (DMCF) PNVT - Sensitive Species

Goodding's onion, Merriam's shrew

Goodding's onion has a fine filter habitat need for cool forested, understory microclimate sites (it is rhizomatous and grows in clusters under trees). Because desired conditions for forest structure and density are similar to PPF (more open canopies), the following guideline is included to ensure its more shaded needs are met:

- Wildlife GL – Cool and/or dense vegetation cover should be provided for species needing these habitat components (e.g., Goodding's onion, black bear, White Mountains chipmunk).

Merriam's shrew has a fine filter habitat need for wet meadows and forest openings which provide the terrestrial insects, worms and other invertebrates that the shrew preys upon. Because desired conditions for forest structure and density are similar to PPF (more open canopies), the following guidelines are included to ensure its needs are met:

- Dry Mixed Conifer GL – Where consistent with project or activity objectives, canopy cover should be retained on the south and southwest sides of small, existing forest openings that are naturally cooler and moister. These small (generally one-tenth to one-quarter acre) shaded openings provide habitat conditions needed by small mammals, plants, and insects (e.g., Merriam's shrew, Mogollon clover, four-spotted skipperling butterfly). Where these openings naturally occur across a project area, these conditions should be maintained on an average of two or more such openings per 100 acres.
- Wildlife and Rare Plants GL – Management and activities should not contribute to a trend toward the Federal listing of a species.

Table 8 compares the viability effectiveness of the alternatives. **Alternatives B and D** would provide the greatest viability effectiveness for these DMCF sensitive species, followed by **alternative C**, as compared to **alternative A**.

Individuals of these two DMCF sensitive species may be impacted by implementation of any of the alternatives, which may be somewhat more likely under alternative A. However, none of the alternatives would lead to a trend toward Federal listing. This is because alternative objectives (see table 3) are expected to move habitat toward desired conditions (see the "Vegetation" section) and the guidelines above additionally provide for these species' needs.

Table 8. Viability effectiveness for sensitive species associated with DMCF

Sensitive FPS		Viability Effectiveness (coarse and fine filter)			
		Alt. A	Alt. B	Alt. C	Alt. D
Fine Filter	Goodding's onion	+ + +	+ + +	+ +	+ + +
	Merriam's shrew	+ +	+ + +	+ + +	+ + +
Coarse filter - ME		+ +	+ + +	+ + +	+ + +
Total effectiveness +'s		7	9	8	9

Wet Mixed Conifer Forest (WMCF) and Spruce Fir Forest (SFF) PNVTs - Sensitive Species

White Mountains chipmunk, southern red-backed vole

These two sensitive species need ample litter and down debris (logs). Decaying logs provide fungi that both species feed upon, while litter provides insects, invertebrates, and cover for the vole. Guidelines that contribute to these needs follow:

- Soil GL – Coarse woody debris retention and/or creation should be used as needed to help retain long-term soil productivity.
- Wildlife GL – Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.
- Wildlife and Rare Plants GL – Management and activities should not contribute to a trend toward the Federal listing of a species.

Table 9 compares the viability effectiveness of the alternatives (identical for both PNVTs). **Alternative D** would provide the greatest viability effectiveness for WMCF sensitive species as compared to **alternatives A, B, and C**, but all are similar. Individuals of these two species may be impacted by implementation of any of the alternatives. However, none of the alternatives would lead to a trend toward Federal listing. This is because alternative objectives (see table 3) are expected to move habitat toward desired conditions in WMCF (see the "Vegetation" section) and the guidelines above additionally provide for these species' needs.

Table 9. Viability effectiveness for sensitive species associated with WMCF

Sensitive FPS		Viability Effectiveness (coarse and fine filter)			
		Alt. A	Alt. B	Alt. C	Alt. D
Fine Filter	White Mountains chipmunk	+ +	+ + +	+ + +	+ + +
	Southern red-backed vole	+ + +	+ +	+ +	+ + +
Coarse filter - ME		+ +	+ + +[1]	+ + +[1]	+ + +[1]
Total effectiveness +'s		7	8	8	9

[1] ME for SFF under alternatives B, C, and D is like alternative A, i.e., ++ ; however, it does not change the relative viability effectiveness of the alternatives.

Madrean Pine-Oak Woodland (MPOW) PNVT - Sensitive Species

Greene milkweed

This rare species can be impacted by fire and livestock use so providing a fine filter habitat need for adjacent untreated areas helps ensure conditions free of these risks will be available in some locations across the landscape of this PNVT. The following guidelines are included to ensure its needs are met:

- All PNVTs GL – Restoration methods, such as thinning or prescribed fire, should leave a mosaic of untreated areas within the larger treated project area to allow recolonization of treated areas by plants, small mammals, and insects (e.g., long-tailed voles, fritillary butterflies).
- Wildlife GL – Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.
- Wildlife and Rare Plants GL – Management and activities should not contribute to a trend toward the Federal listing of a species.

Table 10 compares the viability effectiveness of the alternatives. **Alternatives B and D** would have the greatest viability effectiveness, followed by **alternative C**, then **alternative A**.

Individuals of this species may be impacted by implementation of the alternatives which may be more likely under alternatives A and C as compared to alternatives B and D. However, none of the alternatives would lead to a trend toward Federal listing. This is because alternative objectives (see table 3) are expected to move habitat toward desired conditions (see the "Vegetation" section) and the guidelines above provides for these species' needs.

Table 10. Viability effectiveness for sensitive species associated with MPOW

Sensitive FPS		Viability Effectiveness (coarse and fine filter)			
		Alt. A	Alt. B	Alt. C	Alt. D
Fine Filter	Greene milkweed	+	+ + +	+ +	+ + +
Coarse filter - ME		+	+ + +	+ +	+ + +
Total effectiveness +'s		2	6	4	6

Montane/Subalpine Grassland (MSG) PNVT - Sensitive Species

Ferris' copper butterfly, nitocris and nakomis fritillary butterflies, dwarf shrew, long-tailed vole, White Mountains ground squirrel

These sensitive butterfly species utilize seasonally wetted swales which provide nectaring plants and damp sites for minerals.

The three mammals do not move great distances and the squirrel nests underground. These areas provide small invertebrate prey for the shrew, and seeds and plant material for the vole and ground squirrel. Providing a fine filter habitat need for adjacent untreated areas helps ensure conditions will be available in some locations across the landscape of this PNVT for these species.

The following plan components are included to ensure that all these species needs are met:

- All PNVTs GL – Restoration methods, such as thinning or prescribed fire, should leave a mosaic of untreated areas within the larger treated project area to allow recolonization of treated areas by plants, small mammals, and insects (e.g., long-tailed voles, fritillary butterflies).
- All PNVTs GL – Landscape scale restoration projects should be designed to spread treatments out spatially and/or temporally within the project area to reduce implementation impacts and allow reestablishment of vegetation and soil cover.
- Wildlife GL – Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.
- Wildlife and Rare Plants GL – Management and activities should not contribute to a trend toward the Federal listing of a species.

Table 11 compares the viability effectiveness of the alternatives. **Alternatives B, C, and D** would have the greatest viability effectiveness for these MSG sensitive species as compared to **alternative A**.

Individuals of these six species may be impacted by implementation of any of the alternatives which may be more likely under alternative A. However, none of the alternatives would lead to a trend toward Federal listing because viability has been provided by each alternative. This is because alternative

objectives (see table 3) are expected to move habitat toward desired conditions (see the "Vegetation" section) and the guidelines above additionally provides for these species' needs.

Table 11. Viability effectiveness for sensitive species associated with MSG

Sensitive FPS		Viability Effectiveness (coarse and fine filter)			
		Alt. A	Alt. B	Alt. C	Alt. D
Fine Filter	Ferris' copper butterfly	+ +	+ + +	+ + +	+ + +
	Nitocris fritillary butterfly	+ +	+ + +	+ + +	+ + +
	Nanomis fritillary butterfly	+ +	+ + +	+ + +	+ + +
	Dwarf shrew	+ +	+ + +	+ + +	+ + +
	Long-tailed vole	+ +	+ + +	+ + +	+ + +
	White Mountains ground squirrel	+ +	+ + +	+ + +	+ + +
Coarse filter - ME		+	+ + +	+ +	+ + +
Total effectiveness +'s		13	21	20	21

Great Basin Grassland (GBG) PNVT - Sensitive Species

Springerville pocket mouse, White Mountains ground squirrel, Greene milkweed, Parish alkali grass

These two small mammals do not move great distances. In addition, these areas provide forage in plants and roots for the vole and squirrel. The milkweed can be impacted by fire and livestock use, and the grass is highly localized on only alkali wet meadows or drainages. Providing a fine filter habitat need for adjacent untreated areas helps ensure conditions for both plants will be available in some locations across the landscape of this PNVT for these species. The following guidelines are included to ensure needs of these species are met:

- All PNVTs GL – Restoration methods, such as thinning or prescribed fire, should leave a mosaic of untreated areas within the larger treated project area to allow recolonization of treated areas by plants, small mammals, and insects (e.g., long-tailed voles, fritillary butterflies).
- All PNVTs GL – Landscape scale restoration projects should be designed to spread treatments out spatially and/or temporally within the project area to reduce implementation impacts and allow reestablishment of vegetation and soil.
- Wildlife GL – Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.
- Wildlife GL – The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebbs willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded.
- Wildlife and Rare Plants GL – Management and activities should not contribute to a trend toward the Federal listing of a species.

Table 12 compares the viability effectiveness of the alternatives. **Alternatives B and D** would provide the greatest viability effectiveness followed by **alternatives C and A**.

Individuals of these three species may be impacted by implementation of any of the alternatives which may be more likely under alternative A. However, none of the alternatives would lead to a trend toward Federal listing because viability has been provided by each alternative. This is because alternative objectives (see table 3) are expected to move habitat toward desired conditions (see the "Vegetation" section) and the guidelines above additionally provides for these species' needs.

Table 12. Viability effectiveness for sensitive species associated with GBG

Sensitive FPS		Viability Effectiveness (coarse and fine filter)			
		Alt. A	Alt. B	Alt. C	Alt. D
Fine Filter	Springerville pocket mouse	+ +	+ + +	+ + +	+ + +
	White Mountains ground squirrel	+ +	+ + +	+ + +	+ + +
	Parish alkali grass	+ +	+ + +	+ + +	+ + +
Coarse filter - ME		+	+ + +	+	+ + +
Total effectiveness +'s		7	12	10	12

Semi-Desert Grassland (SDG) PNVT – Sensitive Species

There are no sensitive forest plan species within the semi-desert grassland that have additional fine filter habitat needs.

High Water Quality - Sensitive Species

Water shrew, bald eagle, northern leopard frog, northern Mexican gartersnake, narrow-headed gartersnake, California floater

All of these six sensitive species are found within the various riparian PNVTs and they require high water quality. High water quality is necessary for their breathing and/or feeding and reproduction—for either themselves or their prey. Because these species occur across PNVTs, desired conditions from other resource areas that contribute to their viability as well as fine filter standards and guidelines are listed:

- Water Resources DC – Water quality, stream channel stability, and aquatic habitats retain their inherent resilience to natural and other disturbances.
- Water Resources DC – Vegetation and soil conditions above the floodplain protect downstream water quality, quantity, and aquatic habitat.
- Water Resources DC – Water quality meets the needs of desirable aquatic species such as the California floater, northern and Chiricahua leopard frogs, and invertebrates that support fish populations.
- Aquatic Habitat and Species DC – Streamflows, habitat, and water quality support native aquatic and riparian dependent species and habitat.
- Water Resources GL – To protect water quality and aquatic species, heavy equipment and vehicles driven into a water body to accomplish work should be completely clean of petroleum residue. Water levels should be below the gear boxes of the equipment in use. Lubricants and fuels should be sealed such that inundation by water shall not result in leaks.
- Water Resources GL – Streams, streambanks, shorelines, lakes, wetlands, and other bodies of water should be protected from detrimental changes in water temperature and sediment to protect aquatic species and riparian habitat.
- Riparian Area GL – Storage of fuels and other toxicants should be located outside of riparian areas to prevent spills that could impair water quality or harm aquatic species.

- Riparian Area GL – Equipment should be fueled or serviced outside of riparian areas to prevent spills that could impair water quality or harm aquatic species.
- Wildlife and Rare Plants GL – Management and activities should not contribute to a trend toward the Federal listing of a species.

Table 13 compares the viability effectiveness of the alternatives. **Alternative B** would provide the greatest viability effectiveness for these high water quality sensitive species as compared to **alternatives A, C, and D** which are similar.

Individuals of these six species may be impacted by implementation of any of the alternatives. However, none of the alternatives would lead to a trend toward Federal listing because viability has been provided by each alternative. This is because alternative objectives (see table 3) are expected to move habitat toward desired conditions (see the "Vegetation" section) and the guidelines above additionally provide for these species' needs.

Table 13. Viability effectiveness for sensitive species associated with high water quality

Sensitive FPS		Viability effectiveness (coarse and fine filter)			
		Alt. A	Alt. B	Alt. C	Alt. D
Fine Filter	Water shrew	+ +	+ + +	+ + +	+ + +
	Bald eagle	+ + +	+ + +	+ + +	+ + +
	Northern leopard frog	+ + +	+ + +	+ + +	+ +
	Northern Mexican gartnersnake	+ +	+ + +	+ +	+ + +
	Narrow-headed gartersnake	+ +	+ + +	+ +	+ + +
	California floater	+ + +	+ + +	+ + +	+ +
Coarse filter - ME		+ + +	+ + +	+ + +	+ +
Total effectiveness +'s		18	21	19	18

Unique Habitat (Healthy Riparian Conditions) - Sensitive Species

Water shrew, New Mexico meadow jumping mouse, northern Mexican gartersnake, narrow-headed gartersnake, Arizona willow, Bebbs willow

All of these six sensitive animals forage and hunt within the riparian zone. All require tall, dense, untrampled vegetation for cover; the shrew and mouse for hiding cover from predators, and the snakes for hunting cover and prey habitat. The willows need saturated, uncompacted soils, and protection from ungulate grazing in the spring and early summer. The following guidelines (and one objective) help provide for their needs:

- Riparian Areas Objective – Annually, work with partners to reduce animal damage to native willows and other riparian species on an average of 5 miles of riparian habitat (only for alternatives B, C, and D).
- Water Resources GL – Streams, streambanks, shorelines, lakes, wetlands, and other bodies of water should be protected from detrimental changes in water temperature and sediment to protect aquatic species and riparian habitat.
- Aquatic Habitat and Species GL – Sufficient water should be left in streams to provide for aquatic species and riparian vegetation.

- Riparian Areas GL – Ground-disturbing projects (including prescribed fire) which may degrade long-term riparian conditions should be avoided.
- Riparian Areas GL – Active grazing allotments should be managed to maintain or improve to desired riparian conditions.
- Wildlife and Rare Plants GL – Management and activities should not contribute to a trend toward the Federal listing of a species.
- Dispersed Recreation ST – Dispersed campsites shall not be designated in areas with sensitive soils or within 50 feet of streams, wetlands, or riparian areas to prevent vegetation and bank damage, soil compaction, additional sediment, or soil and water contamination.
- Livestock Grazing GL – Critical areas should be managed to address the inherent or unique site factors, condition, values, or potential conflicts associated with them.
- Livestock Grazing GL – New livestock troughs, tanks, and holding facilities should be located out of riparian areas to reduce concentration of livestock in these areas. Existing facilities in riparian areas should be modified, relocated, or removed where their presence is determined to inhibit movement toward desired riparian or aquatic conditions.
- Livestock Grazing GL – To prevent resource damage (e.g., streambanks) and disturbance to federally listed and sensitive wildlife species, trailing of livestock should not occur along riparian areas. Where no alternative route is available, approval may be granted where effective mitigation measures are implemented (e.g., timing of trailing, number of livestock trailed at one time).

Table 14 compares the viability effectiveness of the alternatives. **Alternatives B and D** would provide the greatest viability effectiveness as compared to **alternatives A and C**. This is because of differences in treatment objectives. Restoration objectives for desired riparian composition, structure, and function are only on an "opportunity basis" under alternatives A and C. Treatments to restore desired conditions under alternatives B and C range from 200 to 600 acres per year. In addition, alternative A would not include working with partners to reduce animal damage to native riparian species.

Table 14. Viability effectiveness for sensitive species associated with healthy riparian conditions

Sensitive FPS		Viability Effectiveness (coarse and fine filter)			
		Alt. A	Alt. B	Alt. C	Alt. D
Fine Filter	Water shrew	+ +	+ + +	+ +	+ + +
	NM meadow jumping mouse	+ +	+ + +	+ +	+ + +
	Northern Mexican gartnersnake	+ +	+ + +	+ +	+ + +
	Narrow-headed gartersnake	+ +	+ + +	+ +	+ + +
	Arizona willow	+ +	+ + +	+ + +	+ + +
	Bebbs willow	+ +	+ + +	+ + +	+ + +
Coarse filter - ME		+ +	+ + +	+ +	+ + +
Total effectiveness +'s		14	21	16	21

Individuals of these six species may be impacted by implementation of any of the alternatives. However, none of the alternatives would lead to a trend toward Federal listing because viability has been provided by each alternative. This is because alternative objectives for each alternative are expected to move habitat toward desired conditions (see the Vegetation Specialist Report [Forest Service 2014b]) and the above guidelines and other plan components additionally provide for these species' needs.

Unique Habitat (Large Trees/Snags, Dense Canopies) - Sensitive Species

Allen's big-eared bat, bald eagle

Maternity colonies of Allen's big-eared bats are found in boulder piles, crevices, and beneath the bark of large ponderosa pine snags. The bald eagle has a habitat need for tall, healthy, and strong trees to build nests in. These may be riparian trees like cottonwood or forested PNVT trees near water. Bald eagles have nested in a very large ponderosa pine since 1993 located near Luna Lake and large Douglas-fir trees near Crescent Lake since 2007. Breeding, incubating, and young rearing eagles are especially sensitive to disturbance. Desired conditions from different PNVTs that contribute to their viability as well as fine filter standards and guidelines are listed:

- All PNVTs DC – Old or large trees, multistoried canopies, large coarse woody debris, and snags provide the structure, function, and associated vegetation composition as appropriate for each forested and woodland PNVT.
- Riparian Areas DC – Vegetation is structurally diverse, often dense, providing for high bird species diversity and abundance, especially neotropical migratory birds. It includes large trees and snags in the cottonwood willow and mixed broadleaf deciduous riparian forests to support species such as beaver, yellow-billed cuckoo, bald eagle, Arizona gray squirrel, and various bat species.
- Wildlife GL – Any action likely to cause a disturbance and take to bald and golden eagles in nesting and young rearing areas should be avoided per the Bald and Golden Eagle Protection Act.
- Wildlife and Rare Plants GL – Management and activities should not contribute to a trend toward the Federal listing of a species.

Table 15 compares the viability effectiveness of the alternatives. **Alternative D** provides somewhat greater viability effectiveness, followed by **alternatives A and B, then alternative C**. Individual Allen's big-eared bats may be impacted by implementation of any of the alternatives. Individual bald eagles could not be impacted by implementation of any alternative unless a permit for limited, non-purposeful take of bald eagles (and golden eagles) is issued by the USFWS.

Table 15. Viability effectiveness for sensitive species associated with large trees/snags and dense canopies

Sensitive FPS		Viability Effectiveness (coarse and fine filter)			
		Alt. A	Alt. B	Alt. C	Alt. D
Fine Filter	Allen's big-eared bat	+ + +	+ +	+ +	+ + +
	Bald eagle	+ + +	+ + +	+ + +	+ + +
Coarse filter - ME		+ +	+ + +	+ +	+ + +
Total effectiveness +'s		8	8	7	9

However, none of the alternatives would lead to a trend toward Federal listing for these two sensitive species because viability has been provided by each alternative. This is because alternative objectives (see table 3) are expected to move habitat toward desired conditions (see the "Vegetation" section), and the guidelines above additionally provides for these species' needs.

Unique Habitat (Dense Low-Mid Canopy with Ample Ground Litter) - Sensitive species

Western red bat

The western red bat is the only sensitive species in this category. On the forests, it is associated primarily with the MBDRF, needing dense canopy for roosting. It is thought this bat burrows into leaf litter or dense

grass during hibernation. Desired conditions from other resource areas that contribute to the viability of this species as well as fine filter standards and guidelines are listed:

- All PNVTs DC – Old or large trees, multistoried canopies, large coarse woody debris, and snags provide the structure, function, and associated vegetation composition as appropriate for each forested and woodland PNVT.
- Riparian Areas DC – Natural ecological disturbances (e.g., flooding, scouring) promote a diverse plant structure consisting of herbaceous, shrub, and tree species of all ages and size classes necessary for the recruitment of riparian dependent species.
- Riparian Areas DC – Riparian vegetation consists mostly of native species that support a wide range of vertebrate and invertebrate species and are free of invasive plant and animal species.
- Riparian Areas DC – Active grazing allotments should be managed to maintain or improve to desired riparian conditions.
- Wildlife GL – Management and activities should not contribute to a trend toward the Federal listing of a species.
- Dispersed Recreation ST – Dispersed campsites shall not be designated in areas with sensitive soils or within 50 feet of streams, wetlands, or riparian areas to prevent vegetation and bank damage, soil compaction, additional sediment, or soil and water contamination.
- Motorized Opportunities GL – As projects occur in riparian or wet meadow areas, unneeded roads or motorized trails should be closed or relocated, drainage restored, and native vegetation reestablished to move these areas toward their desired condition.

Table 16 compares the viability effectiveness of the alternatives. **All alternatives** have nearly the same viability effectiveness, with **alternative C** providing slightly less viability effectiveness. Individual red bats may be impacted by any alternative. However, none of the alternatives would lead to a trend toward Federal listing because viability has been provided by each alternative. This is because alternative objectives (see table 3) are expected to move habitat toward desired conditions (see the "Vegetation" section), and the above guidelines and other plan components additionally provide for these species' needs.

Table 16. Viability effectiveness for sensitive species associated with dense low-mid canopy with ample ground litter

Sensitive FPS		Viability Effectiveness (coarse and fine filter)			
		Alt. A	Alt. B	Alt. C	Alt. D
Fine filter	Western red bat	+ +	+ +	+	+ +
Coarse filter - ME		+ +	+ +	+ +	+ +
Total effectiveness +'s		4	4	3	4

Unique Habitat (Permanent Wet Meadow-Like Areas) - Sensitive Species

Ferris' copper butterfly, nitocris fritillary butterfly, nokomis fritillary butterfly

These sensitive butterfly species have a need for permanent wet meadow areas within forested areas or in WCRAs. These provide nectaring plants and damp sites for minerals. These areas also contain larval host plants: a species of dock or sorrel (genus *Rumex*) for Ferris' copper butterfly and violets (genus *Viola*) for the fritillary butterflies. Drying of these areas from, for instance, stock tank building or soil compaction results in habitat loss. Desired conditions from other resource areas that contribute to the viability of this species as well as fine filter standards and guidelines are listed:

- All PNVTs GL – Restoration methods, such as thinning or prescribed fire, should leave a mosaic of untreated areas within the larger treated project area to allow recolonization of treated areas by plants, small mammals, and insects (e.g., long-tailed voles, fritillary butterflies).
- Riparian Areas DC – Riparian vegetation consists mostly of native species that support a wide range of vertebrate and invertebrate species and are free of invasive plant and animal species.
- Riparian Areas DC – Active grazing allotments should be managed to maintain or improve to desired riparian conditions.
- Wildlife GL – Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.
- Wildlife GL – Management and activities should not contribute to a trend toward the Federal listing of a species.

Table 17 compares the viability effectiveness of the alternatives. **Alternatives B and D** provide the greatest viability effectiveness as compared to **alternatives A and C**. Individual butterflies may be impacted by any alternative. However, none of the alternatives would lead to a trend toward Federal listing because viability has been provided by each alternative. This is because alternative objectives (see table 3) are expected to move habitat toward desired conditions (see the "Vegetation" section), and the above guidelines and other plan components additionally provide for these species' needs.

Table 17. Viability effectiveness for sensitive species associated with permanent wet meadow-like areas

Sensitive FPS		Viability Effectiveness (coarse and fine filter)			
		Alt. A	Alt. B	Alt. C	Alt. D
Fine Filter	Ferris' copper butterfly	+ +	+ +	+	+ +
	nitocris fritillary butterfly	+ +	+ + +	+ + +	+ + +
	nokomis fritillary butterfly	+ +	+ + +	+ + +	+ + +
Coarse filter - ME		+ +	+ + +	+ +	+ + +
Total effectiveness +'s		8	11	9	11

Summary of determinations for sensitive species

All alternatives have plan components that help avoid or minimize impacts to each sensitive FPS as a whole. However, individuals of all species may still be impacted by management and activities under **all alternatives**. **None of the alternatives** would lead to a trend toward federal listing for any of the sensitive FPS because viability is provided for each species, albeit to varying degrees of effectiveness depending on alternative. Overall**, alternatives B and C** (142 and 141 total +'s, respectively) most effectively provides for sensitive FPS followed by **alternative C, then A** (120 and 117 +'s, respectively).

Cumulative Environment Consequences
Unavoidable Adverse Impacts
Irreversible and Irretrievable Commitment of Resources
Adaptive Management

See the same titled sections in the WSR-V for discussion of these topics.

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APPENDICES

APPENDIX A. Sensitive species not considered forest plan species (FPS) and rationale

As part of the 2012 *Iterative Update to Species Considered*, seven sensitive species were not considered forest planning species (FPS). Rationale why they are not considered FPS follows.

Arizona Bell's vireo	*Vireo bellii arizonae*	Lower Sonoran species, not likely on ASNFs
groundcover milkvetch	*Astragalus humistratus* var. *crispulus*	limited distribution but a disturbance species as on road cuts
Gila thistle	*Cirsium gilense*	no collections in the State and confusion with other thistles
heathleaf wild buckwheat	*Eriogonum ericifolium* var. *ericifolium*	unclear nomenclature
Chiricahua gentian	*Gentianella wislizeni*	annual so highly variable year to year, regardless of management
Mogollon hawkweed	*Hieracium brevipilum* *	uncertainty as to habitat requirements
Maguire's penstemon	*Penstemon linariodes* ssp. *Maguirei*	known only from active mining areas

Given the various rationale above, it cannot be determined, based on the non-site specific, programmatic nature of forest plan revision, whether management or actions will impact these species or determine whether a trend toward federal listing would occur or not. As such these sensitive species are not considered forest planning species (FPS), nor addressed further in this biological evaluation.

*formerly *Hieracium fendleri* var. *mogollense*

APPENDIX B. Desired conditions for PNVT habitat relative to sensitive FPS

(footnotes to desired conditions are not included here but found in the land management plan)

Desired Conditions for All PNVTs

Landscape Scale Desired Conditions (10,000 acres or greater)

- Each PNVT contains a mosaic of vegetative conditions, densities, and structures. This mosaic occurs at a variety of scales across landscapes and watersheds. The distribution of physical and biological conditions is appropriate to the natural disturbance regimes affecting the area.
- The vegetative conditions and functions are resilient to the frequency, extent, and severity of ecological disturbances (e.g., fire, insects and disease, flood, climate variability). The landscape is a functioning ecosystem that contains all its components, processes, and better able to cope with climate change.
- Natural processes and human and natural disturbances (e.g., wildland fire, mechanical vegetation treatments) provide desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling. Natural fire regimes are restored. Uncharacteristic fire behavior is minimal or absent on the landscape.
- Wildland fire maintains and enhances resources and, as nearly as possible, is allowed to function in its natural ecological role.
- Native plant communities dominate the landscape.
- The range of species genetic diversity remains within native vegetation and animal populations, thus enabling species to adapt to changing environmental and climatic conditions.
- Vegetative connectivity provides for species dispersal, genetic exchange, and daily and seasonal movements across multiple spatial scales.
- Vegetation characteristics (e.g., density, litter) provide favorable conditions for waterflow and quality.
- Organic soil cover and herbaceous vegetation protect soil, facilitate moisture infiltration, and contribute to plant and animal diversity and ecosystem function.
- Diverse vegetation structure, species composition, densities, and seral states provide quality habitat for native and desirable nonnative plant and animal species throughout their life cycle and at multiple spatial scales. Landscapes provide for the full range of ecosystem diversity at multiple scales, including habitats for those species associated with late seral states and old growth forests.
- Old growth is dynamic in nature and occurs in well-distributed patches that spatially shift across forest and woodland landscapes over time.
- Old or large trees, multistoried canopies, large coarse woody debris, and snags provide the structure, function, and associated vegetation composition as appropriate for each forested and woodland PNVT.
- Vegetation conditions allow for transition zones or ecotones between riparian areas, forests, woodlands, shrublands, and grasslands. Transition zones may shift in time and space due to changing site conditions from disturbances (e.g., fire, climate variability).
- Insect and disease populations are at endemic levels with occasional outbreaks. A variety of seral states usually restricts the scale of localized insect and disease outbreaks.

- Disjunct populations of Chihuahua pine, Arizona cypress, and Rocky Mountain maple are present with the ability to reproduce on capable sites.
- Herbivory is in balance with available forage (i.e., grazing and browsing by authorized livestock, wild horses, and wildlife do not exceed available forage production within established use levels).
- Shrub components contain a diverse array of native vegetation that is well distributed across the landscape to provide nutritional needs for browsers.
- Vegetation provides products—such as wood fiber or forage—to help meet local and regional needs in a manner that is consistent with other desired conditions on a sustainable basis within the capacity of the land.
- Ecosystem services are available as forests, woodlands, grasslands, and riparian communities successfully adapt to a changing and variable climate.

Mid-Scale Desired Conditions (100 to 1,000 acres)

- Stand densities and species compositions are such that vegetation conditions are resilient under a variety of potential future climates.
- Vegetation conditions provide hiding and thermal cover in contiguous blocks for wildlife. Native plant species are present in all age classes and are healthy, reproducing, and persisting.
- Vegetative ground cover (herbaceous vegetation and litter) is optimized to protect and enrich soils and promote water infiltration. There is a diverse mix of cool and warm season grasses and desirable forbs species.
- Grasses, forbs, shrubs, and litter are abundant and continuous to support natural fire regimes.
- The composition, density, structure, and mosaic of vegetative conditions reduce uncharacteristic wildfire hazard to local communities and forest ecosystems.

Fine Scale Desired Conditions (less than 10 acres)

- Rare or unique plant communities (e.g., agaves, Chihuahuan pine) are intact and persisting.
- Herbaceous vegetation amount and structure (e.g., plant density, height, litter, seed heads) provides habitat to support wildlife and prey species.
- Some isolated infestations of mistletoe provide for a diversity of habitat components (e.g., food, nesting, cover) for a variety of species such as owls, squirrels, and some birds and insects.

Desired Conditions for Riparian Areas

Landscape Scale Desired Conditions (10,000 acres or greater)

- Natural ecological disturbances (e.g., flooding, scouring) promote a diverse plant structure consisting of herbaceous, shrub, and tree species of all ages and size classes necessary for the recruitment of riparian-dependent species.
- Riparian-wetland conditions maintain water-related processes (e.g., hydrologic, hydraulic, geomorphic). They also maintain the physical and biological community characteristics, functions, and processes.

Mid-Scale Desired Conditions (100 to 1,000 acres)

- Stream (lotic) riparian-wetland areas have vegetation, landform, and/or large coarse woody debris to dissipate stream energy associated with high waterflow.
- Streams and their adjacent floodplains are capable of filtering, processing, and storing sediment; aiding floodplain development; improving floodwater retention; and increasing groundwater recharge.
- Vegetation and root masses stabilize streambanks, islands, and shoreline features against the cutting action of water.
- Ponding and channel characteristics provide habitat, water depth, water duration, and the temperatures necessary for maintaining populations of riparian-dependent species and for their dispersal.
- Beavers occupy capable stream reaches and help promote the function and stability of riparian areas.
- Lentic riparian areas (e.g., wet meadows, fens, bogs) have vegetation and landform present to dissipate wind action, wave action, and overland flow from uplands.
- Wetland riparian areas are capable of filtering sediment and aiding floodplain development that contribute to water retention and groundwater recharge.
- Willows (e.g., Bebb, Geyer, Arizona, Goodding's) are reproducing with all age classes present, where the potential exists.
- The spatial extent of wetlands is maintained.
- Soil compaction from forest activities (e.g., vehicle use, recreation, livestock grazing) does not negatively impact riparian areas.
- Riparian vegetation consists mostly of native species that support a wide range of vertebrate and invertebrate species and are free of invasive plant and animal species.
- Riparian obligate species within wet meadows, along streambanks, and active floodplains provide sufficient vegetative ground cover (herbaceous vegetation and litter) to protect and enrich soils, trap sediment, mitigate flood energy, stabilize streambanks, and provide for wildlife and plant needs.
- Diversity and density of riparian forest vegetation provides for breeding, escape, hiding, and resting cover for wildlife and provides travelways between other habitat areas and seasonal ranges.

Fine Scale Desired Conditions (less than 10 acres)

- The ecological function of riparian areas is resilient to animal and human use.
- Riparian soil productivity is optimized as described by the specific TES map unit under consideration as indicated by the vigor of the herbaceous vegetation community. Based on species composition, ungrazed plant heights range from 10 inches to 36 inches.
- Floodplains and adjacent upland areas provide diverse habitat components (e.g., vegetation, debris, logs) as necessary for migration, hibernation, and brumation (extended inactivity) specific to the needs of riparian-obligate species (e.g., New Mexico meadow jumping mouse, Arizona montane vole, narrow-headed gartersnake).
- Large coarse woody debris provides stability to riparian areas and stream bottoms lacking geologic control (e.g., bedrock) or geomorphic features (e.g., functioning floodplains, stream sinuosity, width/depth ratio).

- Vegetation is structurally diverse, often dense, providing for high bird species diversity and abundance, especially neotropical migratory birds. It includes large trees and snags in the cottonwood-willow and mixed broadleaf deciduous riparian forests to support species such as beaver, yellow-billed cuckoo, bald eagles, Arizona gray squirrel, and various bat species.
- Annually, work with partners to reduce animal damage to native willows and other riparian species on an average of 5 miles of riparian habitat.

Desired Conditions for Forests: Ponderosa Pine

Landscape Scale Desired Conditions (10,000 acres or greater)

- The ponderosa pine forest is a mosaic of structural states ranging from young to old trees. Forest structure is variable but uneven-aged and open in appearance. Sporadic areas of even-aged structure may be present on 10 percent or less of the landscape to provide structural diversity.
- The forest arrangement consists of individual trees, small clumps, and groups of trees interspersed within variably-sized openings of grasses, forbs, and shrubs. Vegetation associations are similar to reference conditions. The size, shape, and number of trees per group and the number of groups per area vary across the landscape. Tree density may be greater in some locations, such as north-facing slopes and canyon bottoms.
- The ponderosa pine forest is composed predominantly of vigorous trees, but declining, top-killed, lightning-scarred, and fire-scarred trees provide snags and coarse woody debris. Snags and coarse woody debris are well distributed throughout the landscape. Ponderosa pine snags are typically 18 inches or greater in diameter and average 1 to 2 per acre.
- Coarse woody debris, including logs, ranges from 3 to 10 tons per acre. Logs average 3 per acre within the forested area of the landscape.
- Where it naturally occurs, Gambel oak is present with all age classes represented. It is reproducing to maintain or expand its presence on capable sites across the landscape. Large Gambel oak snags are typically 10 inches or larger in diameter and are well distributed.
- Grasses, forbs, shrubs, needles, leaves, and small trees support the natural fire regime. The larger proportion (60 percent or greater) of soil cover is composed of grasses and forbs as opposed to needles and leaves.
- Old growth occurs throughout the landscape, in small, discontinuous areas consisting of clumps of old trees, or occasionally individual old trees. Other old growth components are also present including dead trees (snags), downed wood (coarse woody debris), and/or structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).
- Frequent, low to mixed severity fires (fire regime I), occurring approximately every 2 to 17 years, are characteristic in this PNVT.

Mid-Scale Desired Conditions (100 to 1,000 acres)

- Ponderosa pine forest is characterized by variation in the size and number of tree groups depending on elevation, soil type, aspect, and site productivity. The more biologically productive sites contain more trees per group and more groups per area, resulting in less space between groups. Openings typically range from 10 percent in more biologically productive sites to 70 percent in the less productive sites. Tree density within forested areas ranges from 20 to 80 square feet basal area per acre.

- The tree group mosaic comprises an uneven-aged forest with all age classes, size classes, and structural stages present. Occasionally, patches of even-aged forest structure are present (less than 50 acres). Disturbances sustain the overall age and structural distribution.
- Fires burn primarily on the forest floor and do not spread between tree groups as crown fire.
- Forest structure in the wildland-urban interface (WUI) may have smaller, more widely spaced groups of trees than in the non-WUI areas.
- Northern goshawk post-fledging family areas (PFAs) may contain 10 to 20 percent higher basal area in mid-aged to old tree groups than northern goshawk foraging areas and the surrounding forest.
- Northern goshawk nest areas have forest conditions that are multi-aged and dominated by large trees with relatively denser canopies than the surrounding forest.

Fine Scale Desired Conditions (less than 10 acres)

- Trees typically occur in irregularly shaped groups and are variably spaced with some tight clumps. Tree crowns in the mid- to old-aged groups are interlocking or nearly interlocking providing for species such as Abert's squirrel.
- Openings surrounding tree groups are variably shaped and composed of a grass, forb, and shrub mix. Some openings may contain individual trees.
- Trees within groups are of similar or variable ages and may contain species other than ponderosa pine. Tree groups are typically less than 1 acre and average ½ acre. Mid- to old-aged tree groups consist of approximately 2 to 40 trees with interlocking canopies.
- Where Gambel oak occurs, the majority are single trunk trees over 8 inches in diameter with full crowns.

Desired Conditions for Forests: Dry Mixed Conifer

Landscape Scale Desired Conditions (10,000 acres or greater)

- The dry mixed conifer forest is a mosaic of conditions composed of structural states ranging from young to old trees. Forest structure and density are similar to ponderosa pine forest. Forest appearance is variable but uneven-aged and open. Sporadic areas of even-aged structure may be present on 10 percent or less of the landscape to provide structural diversity.
- The forest arrangement consists of small clumps and groups of trees interspersed within variably-sized openings of grass, forb, and shrub vegetation associations similar to reference conditions. Size, shape, number of trees per group, and number of groups per area are variable across the landscape. Where they naturally occur, groups of Gambel oak are healthy and maintained or increased. Tree density may be greater in some locations, such as north-facing slopes and canyon bottoms.
- The dry mixed conifer forest is composed predominantly of vigorous trees, but declining, top-killed, lightning-scarred, and fire-scarred trees provide snags and coarse woody debris. Snags and coarse woody debris are well distributed throughout the landscape. Snags are typically 18 inches in diameter or greater and average 3 per acre.
- Coarse woody debris, including logs, ranges from 5 to 15 tons per acre. Logs average 3 per acre within the forested area of the landscape.
- Southwestern white pine is present with the ability to reproduce on capable sites.

- Grasses, forbs, shrubs, needles, leaves, and small trees support the natural fire regime. The larger proportion (60 percent or greater) of soil cover is composed of grasses and forbs as opposed to needles and leaves.
- Old growth occurs throughout the landscape, in small, discontinuous areas consisting of clumps of old trees, or occasionally individual old trees. Other old growth components are also present including dead trees (snags), downed wood (coarse woody debris), and/or structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).
- Frequent, low to mixed severity fires (fire regime I) occurring every 10 to 22 years are characteristic in this PNVT.

Mid-Scale Desired Conditions (100 to 1,000 acres)

- The dry mixed conifer forest is characterized by a variety of size and number of tree groups depending on elevation, soil type, aspect, and site productivity. The more biologically productive sites contain more trees per group and more groups per area, resulting in less space between groups. Openings typically range from 10 percent in more biologically productive sites to 50 percent in less productive sites. Tree density within forested areas ranges from 30 to 100 square feet basal area per acre.
- The mosaic of tree groups is composed of uneven-aged forest. All age classes and structural stages are present. Occasionally, there are small patches (less than 50 acres) of even-aged forest present. Disturbances sustain the overall age and structural distribution.
- Fire burns primarily on the forest floor and does not spread between tree groups as crown fire.
- Forest structure in the wildland-urban interface (WUI) may have smaller, more widely spaced groups of trees than in the non-WUI areas.
- Northern goshawk post-fledging family areas (PFAs) may contain 10 to 20 percent higher basal area in mid-aged to old tree groups than northern goshawk foraging areas and the surrounding forest.
- Northern goshawk nest areas have forest conditions that are multi-aged but are dominated by large trees with relatively denser canopies than the surrounding forest.

Fine Scale Desired Conditions (less than 10 acres)

- Trees typically occur in irregularly-shaped groups and are variably spaced with some tight clumps. Tree crowns in the mid- to old-aged groups are interlocking or nearly interlocking providing for species such as red squirrel.
- Openings surrounding tree groups are composed of a grass, forb, and shrub mix. Some openings may contain individual trees or snags.
- Trees within groups are of similar or variable ages and one or more species. Tree group sizes typically are less than 5 acres, but often less than 1 acre, and at the mature and old stages consist of approximately 2 to 50 trees.
- Where Gambel oak occurs, the majority are single trunk trees over 8 inches in diameter with full crowns.

Desired Conditions for Forests: Wet Mixed Conifer

Landscape Scale Desired Conditions (10,000 acres or greater)

- The wet mixed conifer forest is a mosaic of structural stages and seral states ranging from young to old trees. The landscape arrangement is an assemblage of variably sized and aged groups and patches of trees and other vegetation associations similar to reference conditions.
- All seral states are present across the landscape, with each state characterized by distinct dominant species composition, biological and physical conditions, and enough of each state is present to develop into the next state progressively over time.
- Canopies are more closed than dry mixed conifer. An understory, consisting of native grass, forbs, and/or shrubs, is present.
- The wet mixed conifer forest is composed predominantly of vigorous trees, but declining, top-killed, lightning-scarred, and fire-scarred trees provide snags and coarse woody debris. Snags and coarse woody debris are well distributed throughout the landscape. The number of snags and logs and amount of coarse woody debris varies by seral state ranging from 8 to more than 16 tons per acre.
- Old growth occurs over large, continuous areas. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris), and/or structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).
- Mixed severity fire (fire regime III) is characteristic of this forest. High severity fires (fire regimes IV and V) rarely occur.

Mid-Scale Desired Conditions (100 to 1,000 acres)

- The size and number of groups and patches vary depending on disturbance, elevation, soil type, aspect, and site productivity. Patch sizes vary but are frequently hundreds of acres and rarely thousands of acres. Groups of tens of acres or less are relatively common. There is a mosaic of primarily even-aged groups and patches, which vary in size, species composition, and age. Grass, forb, and shrub openings created by disturbances may comprise 10 to 100 percent of the area depending on the type of disturbance.
- Uneven-aged groups and patches, comprising about 20 percent of this PNVT, provide for species such as the black bear and red-faced warbler that need multistoried canopies with dense low- to mid-canopy layers.
- Tree density ranges from 30 to 180 square feet basal area per acre depending upon time since disturbance and seral states of groups and patches.
- There are 20 or more snags greater than 8 inches in diameter per acre and 1 to 5 of those snags are 18 inches or greater in diameter.
- Coarse woody debris, including logs, varies by seral state, ranging from 5 to 20 tons per acre for early-seral states; 20 to 40 tons per acre for mid-seral states; and may be as high as 35 tons per acre, or greater, for late-seral states. These conditions also provide an abundance of fungi including mushrooms and truffles used by small mammals.
- Forested PNVTs in the wildland-urban interface (WUI) are dominated by early-seral, fire-adapted species growing in an overall more open condition than the surrounding forest. These conditions result in fires that burn primarily on the forest floor and rarely spread as crown fire.
- Mixed (fire regime III) and high (fire regime IV) severity fires in this PNVT, occurring every 22 to 150 years along with other disturbances, maintain desired overall tree density, structure,

species composition, coarse woody debris, and nutrient cycling. High severity fires do not exceed patches of 1,000 acres of mortality. Other smaller disturbances occur more frequently.

- Northern goshawk post-fledging family areas (PFAs) may contain 10 to 20 percent higher basal area in mid-aged to old tree groups than northern goshawk foraging areas and the surrounding forest.
- Northern goshawk nest areas have forest conditions that are multi-aged but are dominated by large trees with relatively denser canopies than the surrounding forest.

Fine Scale Desired Conditions (less than 10 acres)

- In mid-aged and older forests, trees are typically variably spaced with crowns interlocking (grouped and clumped trees) or nearly interlocking providing for species such as red squirrel. Trees within groups can be of similar or variable species and ages.
- Small openings are present as a result of disturbances (e.g., wind, disease).

Desired Conditions for Forests: Spruce-Fir

Landscape Scale Desired Conditions (10,000 acres or greater)

- The spruce-fir forest is a mosaic of structural stages and seral states ranging from young to old trees and is composed of multiple species. The landscape arrangement is an assemblage of variably sized and aged groups and patches of trees and other vegetation similar to reference conditions.
- Tree canopies in this forest are closed. An understory, consisting of native grass, forbs, and/or shrubs, is present in early seral states and is replaced by trees in later seral states.
- The spruce-fir forest is composed predominantly of vigorous trees, but declining top-killed, lightning-scarred, and fire-scarred trees provide snags and coarse woody debris. Snags and coarse woody debris are well distributed throughout the landscape.
- Corkbark fir is present with the ability to reproduce on late-seral sites appropriate for the species.
- Old growth occurs over large, continuous areas. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris), and/or structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).
- In the spruce-fir forested PNVT, mixed to high severity fires (fire regimes III and IV) occur infrequently.

Mid-Scale Desired Conditions (100 to 1,000 acres)

- The size and number of groups and patches vary depending on disturbance, elevation, soil type, aspect, and site productivity. Patch sizes vary but are mostly hundreds of acres and rarely thousands of acres. There may be frequent small disturbances resulting in groups of tens of acres or less. A mosaic of primarily even-aged groups and patches, which vary in size, species composition, and age, is present. Grass, forb, and shrub openings created by disturbances may comprise 10 to 100 percent of the area depending on time since disturbances. Aspen is occasionally present in large patches.
- Uneven-aged groups and patches, comprising about 20 percent of this PNVT, provide for species such as the MacGillivray's warbler and Swainson's thrush that need multistoried canopies with dense low- to mid-canopy layers.

- Tree density ranges from 30 to 250 square feet basal area per acre, depending upon disturbance and seral states of the groups and patches.
- In general, there are 13 to 30 snags greater than 8 inches in diameter per acre and 1 to 3 of those snags are 18 inches or greater in diameter.
- Coarse woody debris, including logs, varies by seral state, ranging from 5 to 30 tons per acre for early-seral states; 30 to 40 tons per acre for mid-seral states; and 40 tons per acre or greater for late-seral states. These conditions also provide an abundance of fungi including mushrooms and truffles used by small mammals.
- The wildland-urban interface (WUI) is comprised primarily of grass/forb/shrub vegetation. Structures in the WUI are surrounded by grassy openings with very few or no trees. These conditions result in ground fires.
- Mixed and high severity fires (fire regime III and IV)—occurring every 150 to 400 years—along with other disturbances maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.
- Northern goshawk post-fledging family areas (PFAs) may contain 10 to 20 percent higher basal area in mid-aged to old tree groups than northern goshawk foraging areas and the surrounding forest.
- Northern goshawk nest areas have forest conditions that are multi-aged but are dominated by large trees with relatively denser canopies than the surrounding forest.

Fine Scale Desired Conditions (less than 10 acres)

- Mid-aged to old trees grow tightly together with interlocking crowns. Trees are of the same size and/or age class in early group/patch development. In late development, they may be multilayered.
- Small openings are present as a result of localized disturbances (e.g., wind, disease).

Desired Conditions for Forests: Aspen

Landscape Scale Desired Conditions (10,000 acres or greater)

- Areas of aspen occur across the forested landscape and are successfully regenerating and being recruited into older and larger size classes. Size classes have a natural distribution, with the greatest number of stems in the smaller size classes.

Mid-Scale Desired Conditions (100 to 1,000 acres)

- Aspen may comprise 10 to 100 percent of the area depending on disturbance (e.g., fire, insects, silvicultural treatments) in multistoried patches.
- As an early seral species, aspen reproduction and recruitment benefit from low severity surface fires in association with ponderosa pine and dry mixed conifer forested PNVTs, and mixed-severity fires in association with wet mixed conifer and spruce-fir forested PNVTs.

Desired Conditions for Woodlands: Madrean Pine-Oak

Landscape Scale Desired Conditions (10,000 acres or greater)

- A mix of desired species, ages, heights, and groupings of trees create a mosaic across the landscape.

- The majority of this woodland has an open canopy consisting of large trees and an herbaceous understory, with some groups of closed canopy. Overall, canopy cover is 10 to 50 percent.
- Snags, averaging 1 to 2 per acre, and older trees are scattered across the landscape. Coarse woody debris averages 1 to 5 tons per acre.
- Understory vegetation includes evergreen oaks, mountain mahogany, grasses, and forbs.
- Ground cover consists of perennial grasses and forbs that frequently carry fire through the landscape.
- Grasses, forbs, shrubs, needles, leaves, and small trees support the natural fire regime. The larger proportion (60 percent or greater) of soil cover is composed of grasses and forbs as opposed to needles and leaves.
- Fires are typically of low or occasionally moderate severity (fire regime I) and occur every 5 to 20 years.

Mid-Scale Desired Conditions (100 to 1,000 acres)

- Some large patches in the Madrean pine-oak woodland are closed canopy, have multiple age classes, large trees, and old growth-like characteristics (e.g., numerous snags, large coarse woody debris) in order to provide for wildlife such as Mexican spotted owl and black bear, that need denser habitat.
- The size and number of groups and patches vary depending on disturbance, elevation, soil type, aspect, and site productivity. Patch sizes vary but are mostly tens of acres, with rare disturbances of hundreds of acres. There may be frequent small disturbances resulting in groups and patches of tens of acres or less. A mosaic of groups and patches of trees, primarily even-aged, that are variable in size, species composition, and age, is present. Grass, forb, and shrub openings created by disturbance may comprise 10 to 100 percent of the area depending on the disturbances.
- Woodland densities range from 15 to 50 square feet basal area per acre.

Fine Scale Desired Conditions (less than 10 acres)

- Single large trees or small groups are widely spaced between large expanses of herbaceous vegetation and shrubs.

Desired Conditions for Woodlands: Piñon-Juniper – Savanna

Landscape Scale Desired Conditions (10,000 acres or greater)

- The piñon-juniper savanna is open in appearance with trees occurring as individuals or in small groups and ranging from young to old. Overall, tree canopy cover is 10 to 15 percent, but may range up to 30 percent.
- Scattered shrubs and a continuous herbaceous understory, including native grasses, forbs, and annuals, are present to support a natural fire regime.
- Grasses, forbs, shrubs, needles, leaves, and small trees support the natural fire regime. The larger proportion (60 percent or greater) of soil cover is composed of grasses and forbs as opposed to needles and leaves.
- Old growth occurs in isolated locations scattered throughout the landscape, as individual old trees or as clumps of old trees. Other old growth components may also be present including dead trees (snags), downed wood (coarse woody debris), and/or structural diversity.

- Fires are low to mixed severity (fire regime I), occurring every 1 to 35 years.

Desired Conditions for Woodlands: Piñon-Juniper – Persistent Woodland

Landscape Scale Desired Conditions (10,000 acres or greater)

- A mix of desired species, ages, heights, and groupings of trees create a mosaic across the landscape.
- Tree canopy cover is closed (greater than 30 percent), shrubs are sparse to moderate, and herbaceous cover is patchy.
- Snags, averaging one to two per acre, and older trees with dead limbs and tops are scattered across the landscape. Coarse woody debris averages 2 to 5 tons per acre.
- Old growth includes old trees, dead trees (snags), downed wood (coarse woody debris), and/or structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).
- Fire is less frequent and more variable than in the savanna due to patchiness of ground cover. The fires that do occur are mixed to high severity (fire regimes II, III, IV, and V).

Mid-Scale Desired Conditions (100 to 1,000 acres)

- Grass and forb cover is maximized, based on site capability, to protect and enrich soils.

Desired Conditions for Grasslands

Landscape Scale Desired Conditions (10,000 acres or greater)

- Perennial herbaceous species dominate and include native grasses, grass-like plants (sedges and rushes), and forbs, and in some locations, a diversity of shrubs.
- Herbaceous vegetation and litter provide for and maintain the natural fire regime (fire regime I and II). In semi-desert grasslands, the natural fire return interval is approximately every 2 to 10 years. In Great Basin grasslands the natural fire return interval is approximately every 10 to 30 years. In montane/subalpine grasslands it ranges from approximately 2 to 400 years, depending on the adjacent forested PNVT.
- Landscapes associated with montane/subalpine grasslands vary from natural appearing where human activities do not stand out (high scenic integrity) to unaltered where only natural ecological changes occur (very high scenic integrity).

Mid-Scale Desired Conditions (100 to 1,000 acres)

- Woody (tree and shrub) canopy cover is less than 10 percent.
- Prairie dogs are present and support healthy grassland soil development and the diversity of associated species (e.g., western burrowing owl).

Fine Scale Desired Conditions (less than 10 acres)

- Average herbaceous vegetation heights vary by grassland PNVT and yearly weather conditions. Ungrazed herbaceous vegetation heights range from 7 to 29 inches in Great Basin grasslands, 7 to 26 inches in montane/subalpine grasslands, and 10 to 32 inches in semi-desert grasslands.

- During the critical pronghorn antelope fawning period (May through June), cool season grasses and forbs provide nutritional forage; while shrubs and standing grass growth from the previous year provide adequate hiding cover (10 to 18 inches) to protect fawns from predation.

Desired Conditions for Interior Chaparral

- In the early seral state, chaparral contains an herbaceous component in the understory. Later seral states are dense, nearly impenetrable thickets with considerable leaf litter. Standing dead material may accumulate in areas that have not burned for several decades. Chaparral is in a constant state of transition from early to late seral state and back again, with fire being the major ecological disturbance.
- Ground cover consists primarily (85 to 95 percent) of shrub litter (e.g., small stems, leaves).
- The majority (85 to 95 percent) of chaparral is closed canopy with some openings of grasses and forbs.
- High severity fires occur every 35 to 100 years (fire regime IV) in a mosaic pattern.

Appendix C. Forest Plan direction in standards and guidelines[6] relative to sensitive FPS and their habitat

Part I identifies forest plan standards (S) and guidelines (G) from various plan sections that reduces threats to and supports viability of forest planning species (FPS) that are grouped by habitat element. Part II identifies other standards and guidelines from specific sections of the plan supporting many or all FPS in general. S and G direction is the same for all alternatives with one exception for Alternative C noted below. Direction that is neutral is not listed.

PART I	
Habitat element	Forest planning species (FPS) by habitat element
Ponderosa Pine Forest	Townsend's big-eared bat, Abert's squirrel, northern goshawk, Grace's warbler, flammulated owl, Mogollon clover, Oak Creek triteleia
G-Where Gambel oak or other native hardwood trees and shrubs are desirable to retain for diversity, treatments should improve vigor and growth of these species. G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-A minimum of six nest areas (known and replacement) should be located per northern goshawk territory. Northern goshawk nest and replacement nest areas should be located around active nests, generally in drainages, at the base of slopes, and on northerly (NW to NE) aspects. Nest areas should generally be 25 to 30 acres each in size G-Northern goshawk post-fledging family areas (PFAs) of approximately 420 acres in size should be designated around the nest sites. G-During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs. G-Aspen restoration and retention efforts should include measures to ensure viability of the aspen stand. G-Active raptor nests should be protected from treatments and disturbance during the nesting season to provide for successful reproduction. Specifically for goshawk nest areas, human presence should be minimized during nesting season of March 1 through September 30. G-The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebbs willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. G-New roads or motorized trails should be located to avoid Mexican spotted owl protected activity centers (PACs), northern goshawk post-fledging family areas (PFAs), and other wildlife areas as identified; seasonal restrictions may be an option. G-Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state.	
Dry Mixed Conifer Forest	red squirrel, red-faced warbler, MacGillivray's warbler, flammulated owl, Mexican spotted owl, Goodding's onion
G-Where Gambel oak or other native hardwood trees and shrubs are desirable to retain for diversity, treatments should improve vigor and growth of these species.	

[6] *A project or activity must be consistent with all applicable standards and guidelines. A project is consistent when its design is in exact accord with the standard; variance from a standard is not allowed except by plan amendment. A project is consistent with a guideline when in exact accord or where it is as effective as the intent of the guideline, as documented. The project or activity documentation will confirm how the project is consistent with applicable plan direction.*

G-Restoration of aspen clones should occur where aspen is over-mature or in decline to maintain a sustainable presence of this species at the landscape level. G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-A minimum of six nest areas (known and replacement) should be located per northern goshawk territory. Northern goshawk nest and replacement nest areas should be located around active nests, generally in drainages, at the base of slopes, and on northerly (NW to NE) aspects. Nest areas should generally be 25 to 30 acres each in size. G-Northern goshawk post-fledging family areas (PFAs) of approximately 420 acres in size should be designated around the nest sites. G-During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs. G-Active raptor nests should be protected from treatments and disturbance during the nesting season to provide for successful reproduction. Specifically for goshawk nest areas, human presence should be minimized during nesting season of March 1 through September 30. G-The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebbs willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. G-New roads or motorized trails should be located to avoid Mexican spotted owl Protected Activity Centers (PACs), northern goshawk post-fledging family areas (PFAs), and other wildlife areas as identified; seasonal restrictions may be an option. S- Authorizations to cut, collect, or use forest products for any personal, commercial, or scientific purpose (i.e., permits, contracts, agreements) shall include provisions to ensure the needs of wildlife, which depend upon those forest products, will continue to be met (e.g., fungi and cone collection with respect to overwinter forage needs of squirrels). G-Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state.	
Wet Mixed Conifer Forest	White Mountains chipmunk, red squirrel, red-faced warbler, Swainson's thrush, dusky blue grouse, MacGillivray's warbler, Mexican spotted owl, Goodding's onion, yellow lady's slipper, wood nymph, yellow Jacob's ladder, heartleaf ragwort, hooded lady's tress
G-Restoration of aspen clones should occur where aspen is over-mature or in decline to maintain a sustainable presence of this species at the landscape level. G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs. G-Active raptor nests should be protected from treatments and disturbance during the nesting season to provide for successful reproduction. Specifically for goshawk nest areas, human presence should be minimized during nesting season of March 1 through September 30. G-The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebbs willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. G-New roads or motorized trails should be located to avoid Mexican spotted owl Protected Activity Centers (PACs), northern goshawk post-fledging family areas (PFAs), and other wildlife areas as identified; seasonal restrictions may be an option. S- Authorizations to cut, collect, or use forest products for any personal, commercial, or scientific purpose (i.e., permits, contracts, agreements) shall include provisions to ensure the needs of wildlife, which depend upon those forest products, will continue to be met (e.g., fungi and cone collection with respect to overwinter forage needs of squirrels).	
Spruce-Fir Forest	White Mountain chipmunk, Swainson's thrush, dusky blue grouse, Goodding's onion, yellow lady's slipper, wood nymph, yellow Jacob's ladder, heartleaf ragwort, hooded lady's tress
G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species	

needs, consistent with project or activity objectives. G-During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs. G-Aspen restoration and retention efforts should include measures to ensure viability of the aspen stand. G-Active raptor nests should be protected from treatments and disturbance during the nesting season to provide for successful reproduction. Specifically for goshawk nest areas, human presence should be minimized during nesting season of March 1 through September 30. G-The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebbs willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. G-New roads or motorized trails should be located to avoid Mexican spotted owl Protected Activity Centers (PACs), northern goshawk post-fledging family areas (PFAs), and other wildlife areas as identified; seasonal restrictions may be an option.	
Aspen	All terrestrial FPS
G- To preclude concentrated herbivore impacts, new surface water development should not be constructed within proximity to aspen stands (approximately a quarter of a mile). G-Restoration of aspen clones should occur where aspen is over-mature or in decline to maintain a sustainable presence of this species at the landscape level. G-When managing for early seral states, competing conifers should be removed from aspen stands when needed to increase aspen longevity and increase diversity of aspen age classes. G-Aspen restoration and retention efforts should include measures to ensure viability of the aspen stand.	
All Woodlands	See species listed under each woodland type
G-Mechanical restoration of woodlands should emphasize individual tree removal to limit ground disturbance. G-Hiding cover, approach cover (by waters), and travel corridor cover should be provided where needed by wildlife.	
Madrean Pine-Oak Woodland	Townsend's big-eared bat, ocelot, mule deer (winter habitat), juniper titmouse, gray vireo, Mexican hemlock parsley, Davidson's cliff carrot, Oak Creek triteleia
G-Treatments should leave single or small groups of medium to large trees that are widely spaced with expanses of herbaceous vegetation and coarse woody debris to provide for soil productivity, traditional uses (e.g., piñon nut gathering), and wildlife needs such as foraging habitat for migratory birds (e.g., black-throated gray warbler, pinyon jay) and other birds. G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs. G-Active raptor nests should be protected from treatments and disturbance during the nesting season to provide for successful reproduction. Specifically for goshawk nest areas, human presence should be minimized during nesting season of March 1 through September 30. G-The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebbs willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. G-New roads or motorized trails should be located to avoid Mexican spotted owl Protected Activity Centers (PACs), northern goshawk post-fledging family areas (PFAs), and other wildlife areas as identified; seasonal restrictions may be an option. G-Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state.	
All Grasslands	See species listed under each grassland type

G-Restoration treatment of grasslands should result in a woody canopy cover of less than 10 percent; more than one treatment may be required. G-Mechanical restoration of grasslands should emphasize individual tree removal to limit soil disturbance. G-New fence construction or reconstruction where pronghorn antelope may be present should have a barbless bottom wire which is 18 inches from the ground to facilitate movement between pastures and other fenced areas. Pole and other types of fences should also provide for pronghorn antelope passage where they are present.	
Montane/Subalpine Grassland	pronghorn antelope, greater western mastiff bat, long-tailed vole, Mogollon vole, dwarf shrew, savannah sparrow, White Mountains ground squirrel, Alberta arctic butterfly, splachnoid dung moss
G-Pronghorn antelope fence and other crossings should be installed along known movement corridors to prevent habitat fragmentation. G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebbs willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. G-New roads or motorized trails should be located to avoid Mexican spotted owl Protected Activity Centers (PACs), northern goshawk post-fledging family areas (PFAs), and other wildlife areas as identified; seasonal restrictions may be an option. G-Grazing use on seasonal allotments should be timed to the appropriate plant growth stage and soil moisture. G-Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state.	
Great Basin Grassland	pronghorn antelope, Gunnison's prairie dog, Mogollon vole, Springerville pocket mouse, White Mountains ground squirrel, western burrowing owl, Montezuma's quail, Greene milkweed
G-Pronghorn antelope fence and other crossings should be installed along known movement corridors to prevent habitat fragmentation. G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-The needs of localized species [e.g., Gunnison prairie dog, Springerville pocket mouse] should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. G-New roads or motorized trails should be located to avoid Mexican spotted owl Protected Activity Centers (PACs), northern goshawk post-fledging family areas (PFAs), and other wildlife areas as identified; seasonal restrictions may be an option. G-Grazing use on seasonal allotments should be timed to the appropriate plant growth stage and soil moisture. G-Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state.	
Semi-desert Grassland	greater western mastiff bat, ocelot, lesser long-nosed bat, Montezuma's quail, plateau giant tiger beetle, Bigelow's onion, Greene milkweed, Arizona sunflower, superb penstemon
G-Pronghorn antelope fence and other crossings should be installed along known movement corridors to prevent habitat fragmentation. G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebbs willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. G-New roads or motorized trails should be located to avoid Mexican spotted owl Protected Activity Centers (PACs), northern goshawk post-fledging family areas (PFAs), and other wildlife areas as identified; seasonal restrictions may be an option.	

G-Grazing use on seasonal allotments should be timed to the appropriate plant growth stage and soil moisture. G-Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state.	
High quality water and/or healthy riparian conditions	beaver, Arizona montane vole, water shrew, NM meadow jumping mouse, common black-hawk, yellow-billed cuckoo, bald eagle, Lincoln's sparrow, Arizona toad, Chiricahua leopard frog, northern leopard frog, lowland leopard frog, northern Mexican gartersnake, narrow-headed gartersnake, false ameletus mayfly, California floater, Mosely caddisfly, Arizona snaketail, White Mountains water penny beetle, Three Forks springsnail, Blumer's dock, Arizona willow, common bladderwort
S-Consistent with existing water rights, water diversions or obstructions shall at all times allow sufficient water to pass downstream to preserve minimum levels of water-flow that maintain aquatic life and other purposes of national forest establishment. G- Streams, streambanks, shorelines, lakes, wetlands, and other bodies of water should be protected from detrimental changes in water temperature and deposits of sediment to protect aquatic species and riparian habitat. G-Streamside management zones should be in place between streams and disturbed areas and/or road locations to maintain suitable stream temperatures and water quality. G-Constraints (e.g., maximum limit to which water level can be drawn down or minimum distance from a connected river, stream, wetland, or groundwater-dependent ecosystem) should be established for new groundwater pumping sites permitted on NFS lands in order to protect the character and function of water resources. G-Projects and activities should avoid damming or impounding free-flowing waters to provide stream-flows needed for aquatic and riparian-dependent species. G-Ground-disturbing projects (including prescribed fire) which may degrade long-term riparian conditions, should be avoided. G-Wet meadows and cienegas should not be used for concentrated activities (e.g., equipment storage, forest product or mineral stockpiling, livestock handling facilities, special uses) that cause damage to soil and vegetation. G-Active grazing allotments should be managed to maintain or improve to desired riparian conditions. G-Storage of fuels and other toxicants should be located outside of riparian areas to prevent spills that could impair water quality or harm aquatic species. G-Equipment should be fueled or serviced outside of riparian areas to prevent spills that could impair water quality or harm aquatic species. G-Construction or maintenance equipment service areas should be located and treated to prevent gas, oil, or other contaminants from washing or leaching into streams. G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-Any action likely to cause a disturbance and take to bald and golden eagles in nesting and young rearing areas should be avoided per the Bald and Golden Eagle Protection Act. G-The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebbs willow, White Mountains paintbrush) should be considered and provided for during project activities to ensure their limited or specialized habitats are not lost or degraded. S-Road maintenance and construction activities shall be designed to reduce sediment (e.g., water bars, sediment traps, and grade dips) while first providing for user safety. G-New roads, motorized trails, or designated motorized areas should be located to avoid meadows, wetlands, riparian areas, stream bottoms, sacred sites, and areas with high concentrations of significant archaeological sites. The number of stream crossings should be minimized or mitigated to reduce impacts to aquatic species. G-As projects occur in riparian or wet meadow areas, unneeded roads or motorized trails should be closed or relocated, drainage restored, and native vegetation reestablished to move these areas towards their desired condition. G-New non-motorized routes should avoid meadows, wetlands, riparian areas, stream bottoms, sacred sites, and areas with high concentrations of significant archaeological sites. The number of stream crossings should be minimized or mitigated to reduce impacts to aquatic habitat. G-Critical areas should be managed to address the inherent or unique site factors, condition, values, or potential conflicts associated with them..	

G-New livestock troughs, tanks, and holding facilities should be located out of riparian areas to reduce concentration of livestock in these areas. Existing facilities in riparian areas should be modified, relocated, or removed where their presence is determined to inhibit movement toward desired riparian or aquatic conditions. G-To minimize potential resource impacts from livestock, salt or nutritional supplements should not be placed within a quarter of a mile of any riparian area or water source. Salt or nutrional supplements should also be located to minimize herbivory impacts to aspen clones. G- To prevent resource damage (e.g., streambanks) and disturbance to federally listed and sensitive wildlife species, trailing of livestock should not occur along riparian areas. Where no alternative route is available, approval may be granted where effective mitigation measures are implemented (e.g., timing of trailing, number of livestock trailed at one time). G-Streambed and floodplain alteration or removal of material should not occur if it prevents attainment of riparian, channel morphology, or streambank desired conditions.	
Shaded or wet meadows	Merriam's shrew, spotted bat, Arizona montane vole, Ferris' copper butterfly, four-spotted skipperling butterfly, nitocris fritillary butterfly, nanomis fritillary butterfly, crenulate moonwort, White Mountains paintbrush, Arizona sneezeweed, wood nymph, heartleaf ragwort, Parish alkali grass, Bebbs willow, Oak Creek triteleia
G-The needs of rare and unique species associated with wetlands, fens, bogs, and springs should be given priority consideration when developing these areas for waterfowl habitat and other uses. G-Wet meadows and cienegas should not be used for concentrated activities (e.g., equipment storage, forest product or mineral stockpiling, livestock handling facilities, special uses) that cause damage to soil and vegetation. G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-Rare and unique features (e.g., talus slopes, cliffs, canyon slopes, caves, fens, bogs, sinkholes) should be protected from damage or loss in order to retain their distinctive ecological functions and maintain viability of associated species. G-New roads, motorized trails, or designated motorized areas should be located to avoid meadows, wetlands, riparian areas, stream bottoms, sacred sites, and areas with high concentrations of significant archaeological sites. The number of stream crossings should be minimized or mitigated to reduce impacts to aquatic species. G-As projects occur in riparian or wet meadow areas, unneeded roads or motorized trails should be closed or relocated, drainage restored, and native vegetation reestablished to move these areas towards their desired condition. G-As projects occur, existing meadow crossings should be relocated or redesigned, as needed, to maintain or restore hydrologic function using appropriate tools such as French drains and elevated culverts. G-New non-motorized routes should avoid meadows, wetlands, riparian areas, stream bottoms, sacred sites, and areas with high concentrations of significant archaeological sites. The number of stream crossings should be minimized or mitigated to reduce impacts to aquatic habitat. G-Critical areas should be managed to address the inherent or unique site factors, condition, values, or potential conflicts associated with them.. G-Grazing use on seasonal allotments should be timed to the appropriate plant growth stage and soil moisture. G-Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state.	
Dense low or mid canopy or shrubs	ocelot, black bear, red-faced warbler, Swainson's thrush, yellow-billed cuckoo, gray catbird, Southwestern willow flycatcher, MacGillivray's warbler, gray vireo
G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-Cool and/or dense vegetation cover should be provided for species needing these habitat components (e.g., Goodding's onion, black bear, White Mountains chipmunk).	

Large trees and/or dense upper canopy	Arizona myotis, Arizona gray squirrel, Abert's squirrel, northern goshawk, zone-tailed hawk, common black-hawk, western yellow-billed cuckoo, evening grosbeak, Grace's warbler, bald eagle, Mexican spotted owl
G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.	
Snags	Allen's lappet-browed bat, Arizona myotis, Arizona gray squirrel
G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs.	
Down wood or debris	southern red-backed vole, western red bat, red-faced warbler, dusky blue grouse, gray catbird
G-Coarse woody debris retention and/or creation should be used as needed to help retain long-term soil productivity. G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.	
Canyon slopes, cliffs, talus or rocky slopes	pale Townsend's big-eared, spotted bat, greater western mastiff bat, American peregrine falcon, Eastwood alumroot, Arizona alumroot
G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G- Rare and unique features (e.g., talus slopes, cliffs, canyon slopes, caves, fens, bogs, sinkholes) should be protected from damage or loss in order to retain their distinctive ecological functions and maintain viability of associated species.. G-As applicable, issuance of special use authorizations should incorporate measures to reduce potential impacts to wildlife and avoid rare and unique habitats (e.g., bogs, fens).	
Landscape connectivity	Mexican wolf, jaguar, mountain lion, bear
G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-New trails and trail relocations should be designed and located so as to not impede terrestrial and aquatic species movement and connectivity. S-New or reconstructed fencing shall allow for wildlife passage, except where specifically intended to exclude wildlife (e.g., elk fencing).	
Collection	Three Forks springsnail, nitocris fritillary butterfly, nanomis fritillary butterfly, yellow lady's slipper, hooded lady's tress
S-When drafting (withdrawing) water from streams or other waterbodies, measures will be taken to prevent entrapment of fish and aquatic organisms and the spread of parasites or disease (e.g., Asian tapeworm, chytrid fungus, whirling disease). G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. S-Special use authorizations for the collection of live species with limited distribution (e.g., some invertebrates, plants) shall include permit provisions to ensure the species persist on site. G-To limit impacts to undisturbed areas, new utilities (e.g., power lines, telephone lines, gas lines) should be co-located within existing corridors whenever technically	

feasible, within existing rights-of-way (including road rights-of-way), or follow major transportation routes.	
Parasitism, disease, predation, entrapment, competition from non-natives, or other damage	disease potential for some bats (Townsend's big-eared, spotted , and greater western mastiff bat); cowbird nest parasitism for Southwest willow flycatcher and gray vireo; possible chytrid disease for Chiricahua leopard, and northern and lowland leopard frogs; invasive predation by crayfish for Three Forks springsnail; mammal entrapment as in troughs; and non-native plant (e.g., musk thistle) or animal (e.g., bull frog) outcompete natives
S-Projects and authorized activities shall be designed to reduce the potential for the introduction of new species or spread of existing invasive or undesirable aquatic or terrestrial non-native populations S-Vegetation treatments shall include measures to reduce the potential for the introduction of invasive plants and animals and damage from non-native insects and diseases. S-New or reconstructed fencing shall allow for wildlife passage, except where specifically intended to exclude wildlife (e.g., elk fencing). S- New livestock watering facilities shall be designed to allow wildlife access and escape. S-Noxious plants and non-native invasive species monitoring and control shall be included in contracts, permits, and agreements. G-Severely disturbed sites should be revegetated with native species when loss of long-term soil productivity is predicted. G-Locally collected seed should be used where available and cost effective. Seeds should be tested to ensure they are free from noxious weeds and invasive non-native plants at a State-certified seed testing laboratory before acceptance and mixing. G-To prevent degradation of native species habitat and the incidental or accidental introduction of diseases or non-native species, aquatic species should not be transferred through management activities from one 6th level HUC watershed to another. G-Sufficient water should be left in streams to provide for aquatic species and riparian vegetation. G-When new water diversions are created or existing water diversions are reanalyzed, measures should be taken to prevent entrapment of fish and aquatic organisms. G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G-Projects and activities should not transfer water between drainages or between unconnected water bodies within the same drainage to avoid spreading disease and aquatic invasive species. G-Pesticide use should minimize impacts on non-target plants and animals. G-During maintenance of existing watering facilities, escape ramps that are ineffective or missing should be replaced. G-Efforts (e.g., temporary fencing, increased herding, herding dogs) should be made to prevent transfer of disease from domestic sheep and goats to bighorn sheep wherever bighorn sheep occur. Permit conversions to domestic sheep or goats should not be allowed in areas adjacent to or inhabited by bighorn sheep. G-To reduce disturbances from human activities and prevent the spread of disease, bat gates should be constructed and installed in cave and mine entrances used as shelter for bats within 3 years of discovery when there are no conflicts with cultural resources. G-Caves and abandoned mines that are used by bats should be managed to prevent disturbance to species and spread of disease (e.g., white-nose syndrome).	
Intentional harassment, forced removal, or avoidable disturbance	Mexican wolf, Gunnison's prairie dog, black bear, many FPS (at least during important life cycle periods)
G-Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives. G- Firelines, helispots, and fire camps should be located to avoid disturbance to critical species and impacts to cultural resources. G-Developed and dispersed recreation sites and other authorized activities should not be located in places that prevent wildlife or livestock access to available water. G-Food and other items that attract wildlife should be managed to prevent reliance on humans and to reduce human-wildlife conflicts. G-Timing restrictions on recreation uses should be considered to reduce conflicts with wildlife needs or soil moisture conditions.	

G-Dispersed campsites should not be located on or adjacent to archaeological sites or sensitive wildlife areas. S-Where trash facilities are provided, they shall be bear -resistant. G-Large group and recreation event special uses should not be authorized within wilderness, recommended wilderness, primitive area, wildlife quiet areas, eligible "wild" river corridors, , riparian and wetland areas, cultural resource sites, Phelps Cabin Botanical Area, Phelps Cabin Research Natural Area (RNA), or recommended RNAs to protect the unique character of these areas.

PART II	
Other Plan areas	Forest planning species in general
All Vegetation	All FPS
S-Vegetation treatments shall include measures to reduce the potential for the introduction of invasive plants and animals and damage from non-native insects and diseases. G-Landscape scale restoration projects should be designed to spread treatments out spatially and/or temporally within the project area to reduce implementation impacts and allow reestablishment of vegetation and soil cover. G-During project design and implementation, precautions should be taken to reduce the potential for damage to residual vegetation in order to prevent premature or excessive mortality. G-Wildland fire may be used to meet PNVT desired conditions and enable natural fire regimes. G-Green slash and decked logs should be managed, in a timely manner, to make them unfavorable bark beetle habitat.	
All Forest Types	See FPS listed under each forest type
S-Harvesting systems shall be selected based on their ability to meet desired conditions and not strictly on their ability to provide the greatest dollar return. S-Clearcutting shall be used only where it is the optimum method for meeting desired conditions. G- **THIS GUIDELINE ONLY APPLIES TO ALTERNATIVES A, B, AND D; IT DOES NOT APPLY TO ALTERNATIVE C:** Where current forests are lacking proportional representation of late seral states and species composition on a landscape scale, old growth characteristics should be retained or encouraged to the greatest extent possible within the scope of meeting other desired conditions (e.g., reduce impacts from insects and disease, reduce the threat of uncharacteristic wildfire). G-Trees, snags, and logs immediately adjacent to active red squirrel cone caches, Abert's squirrel nests, and raptor nests should be retained to maintain needed habitat components and provide tree groupings. G-Hiding cover, approach cover (by waters), and travel corridor cover should be provided where needed by wildlife. G-Healthy southwestern white pine should be retained to maintain the wide range of genetic variability that contributes to resistance against the non-native white pine blister rust disease. G-Where a site-specific analysis indicates the need to reduce fire-kill of desired residual trees, fuel continuity and/or loading should be reduced before use of prescribed fire.	
Soil and Water	All FPS and especially those listed under "high quality water and/or healthy riparian conditions"
G-Projects with ground-disturbing activities should be designed to minimize long and short-term impacts to soil and water resources. Where disturbance cannot be avoided, project-specific soil and water conservation practices and best management practices (BMPs) should be developed G-As State of Arizona water rights permits (e.g., water impoundments, diversions) are issued, the base level of instream flow should be retained by the Apache-	

Sitgreaves NFs G-Treated wastewater may be used to provide wetland habitats. G-To protect water quality and aquatic species, heavy equipment and vehicles driven into a water body to accomplish work should be completely clean of petroleum residue. Water levels should be below the gear boxes of the equipment in use. Lubricants and fuels should be sealed such that inundation by water shall not result in leaks.
Landscape Scale Disturbance Events — All FPS
G-Erosion control mitigation features should be implemented to protect significant resource values and infrastructure such as stream channels, roads, structures, threatened and endangered species, and cultural resources. G-Felling of hazard trees (either dead or alive) should be limited to those which could hit a road, recreation site, building or other infrastructure to protect places where humans, vehicles, or developments would most likely be present. G-Projects and activities (e.g., revegetation, mulching, lop and scatter) should be designed to stabilize soils and restore nutrient cycling, if needed, and establish movement toward the desired conditions for the affected vegetation type(s). G-Where conifer seed sources are lost or poorly distributed, and/or deciduous tree species are not adequately resprouting, artificial regeneration (e.g., planting, seeding) should be used to promote movement towards desired conditions, provided adequate site conditions exist. G-An adequate number and size of snags and logs, appropriate for the affected PNVT, should be retained individually and in clumps to provide benefits for wildlife and coarse woody debris for soil and other resource benefits.
Wildlife and Rare Plants — Primarily federally-listed ESA species
G- Management and activities should not contribute to a trend toward the Federal listing of a species. G- Firelines, helispots, and fire camps should be located to avoid disturbance to critical species and impacts to cultural resources.
Wildlife Quiet Area Management Area (MA) — All FPS present
G-All WQAs should be managed to preclude snowmobile use to minimize disturbance during the critical winter period. G-WQA boundaries should be signed to identify the areas and educate the public about their purpose G-Fences surrounding and within WQAs should be inspected and improved to allow wildlife movement within and outside of the areas. Fences should be removed if no longer needed. G-Hiding cover and travelways for wildlife should be maintained to provide for security and connectivity of habitat. G-Restoration treatments should consider the needs of wildlife (e.g., calving/fawning areas, wallows, game crossings) to minimize potential impacts to the species and their habitat.
Invasive Species — All FPS
G-Project areas should be monitored to ensure there is no introduction or spread of invasive species. G-Treatment of invasive species should be designed to effectively control or eliminate them; multiple treatments may be needed
Recreation Opportunities — All FPS
S-Dispersed campsites shall not be designated in areas with sensitive soils or within 50 feet of streams, wetlands, or riparian areas to prevent bank damage, soil compaction, additional sediment, or soil and water contamination. G- Constructed features should be maintained to support the purpose(s) for which they were built. Constructed features should be removed when no longer needed. G- In dispersed areas, the priority for facilities or minor developments should be access and protection of the environment, rather than the comfort or convenience

of the visitors.	
Motorized Opportunities	All FPS
S-Motorized vehicle travel shall be managed to occur only on the designated system of NFS roads and NFS motorized trails and designated motorized areas. S-Unless specifically authorized, motorized cross-country travel shall be managed to occur only in designated motorized areas. S-Temporary road construction shall minimize the impacts to resource values and to facilitate road rehabilitation. Temporary roads shall be rehabilitated following completion of the activities for which they were constructed G-New roads or motorized trails should be located to avoid Mexican spotted owl protected activity centers (PACs), northern goshawk post-fledgling family areas, and other wildlife areas identified; seasonal restrictions may be an option. G-As projects occur, redundant roads or motorized trails should be removed to reduce degradation of natural resources. G-Roads and motorized trails removed from the transportation network should be treated in order to avoid future risk to hydrologic function and aquatic habitat. G-Roads and motorized trails should be designed and located so as to not impede terrestrial and aquatic species movement and connectivity. G-After management activities occur in areas with high potential for cross-country motorized vehicle use, methods (e.g., barriers, signing) should be used to control unauthorized motorized use.	
Wild and Scenic Rivers	All FPS and especially those listed under "high quality water and/or healthy riparian conditions"
G-Each eligible river's free-flowing condition, outstandingly remarkable values, and classification should be sustained until further study is conducted. G-Each suitable river's free-flowing condition, outstandingly remarkable values, and classification should be maintained until congressional action is completed.	
Lands	All FPS
G-Land acquisitions and exchanges should evaluate, and possibly include, associated beneficial encumbrances (e.g., water rights, mineral rights, easements, instream flow).	
Forest Products	All FPS
G-Permits issued for forest products should include stipulations to protect resources.	
Livestock Grazing	All FPS
G-As areas are mechanically treated or burned, or after large disturbances, timing of livestock grazing should be modified, in order to move towards desired conditions and to accomplish the objectives for the treatment or disturbed area. G- Constructed features should be maintained to support the purpose(s) for which they were built. Constructed features should be removed when no longer needed.	
Minerals and Geology	All FPS present
G-Abandoned mine lands or unneeded mineral material pits should be restored, closed, or rehabilitated to provide for resource protection and public health and safety. G-Oil and geothermal leases should contain the "no surface occupancy" restriction in designated or recommended special areas (e.g., recommended wilderness, primitive area, eligible or suitable wild and scenic rivers corridors, research natural areas, botanical area, and wild horse territory), sacred sites, American Indian TCPs, and properties on the National Register of Historic Places to protect the unique character of these areas.	
Special Uses	All FPS
G-The number of communications sites, energy developments, and energy corridors should be minimized to limit encumbrances of NFS land. G-New communications permittees and equipment should be located or co-located within designated communications sites as identified in appendix C.	

G-New communications sites, energy developments, and energy corridors should be located to minimize impacts to scenery, special areas, and species. G-Existing energy corridors should be used to their capacity with compatible upgraded power lines, before evaluating new routes. G-Environmental disturbance should be minimized by co-locating pipelines, powerlines, fiber optic lines, and communications facilities. G-Power pole installation or replacement under special use authorization should include raptor protection devices in open habitat such as large meadows and grasslands. Raptor protection devices should be installed on existing poles where raptors have been killed. G-The use of underground utilities should be favored to avoid potential conflicts with resources (e.g., scenic integrity, wildlife, wildfire, and heritage).	
Water Rights	All FPS and especially those listed under "high quality water and/or healthy riparian conditions"
S-Forest Service water rights must be put to beneficial use and that use documented and consistent with ADWR regulations. S-Special uses for water diversions shall maintain fish, wildlife, and aesthetic values and otherwise protect the environment. S-Streams on NFS lands with high aquatic values and at risk from new water diversions shall be preserved and protected with instream flow water rights. S-Groundwater withdrawals shall not measurably diminish surface water flows on NFS lands without an appropriate surface water right. G- Constructed features should be maintained to support the purpose(s) for which they were built. Constructed features should be removed when no longer needed.	
Energy Corridor Management Area (MA)	All FPS present
G-As utility facilities are maintained or replaced, relocation of corridors outside of riparian areas should be considered to reduce potential impacts to these ecologically sensitive areas. G-Invasive plant species should be aggressively controlled within energy corridors to prevent or minimize spread. G-Trees and shrubs in riparian areas should only be removed when there is an imminent threat to facilities and, in these cases, trees should be left for large coarse woody debris recruitment into the stream and riparian system. G-When planning and implementing vegetation treatments (e.g., corridor maintenance), vegetation within riparian zones that provides rooting strength important for bank stability should be encouraged.	
Wild Horse Territory MA	All FPS present
G-When wild horse populations exceed the appropriate management level, horses should be removed in accordance with the "Heber Wild Horse Territory Management Plan" (when completed).	
Research Natural Areas (RNAs) MA & Recommended RNAs MA	All FPS
G-Management measures should be used (e.g., fencing) to protect unique features. *(RNA)* G-To minimize impacts to unique and sensitive plant species, recreational activities (other than use on the designated trail) should not be encouraged. *(RNA)* G-To minimize impacts to unique and sensitive plant and animal species, recreational activities should not be encouraged. *(Recommended RNA)* G-If necessary, recommended RNAs should be fenced to manage unique features. *(Recommended RNA)* G-Recommended RNAs should be managed for non-motorized access within the area to minimize ground disturbances and protect the resources which make these areas unique. *(Recommended RNA)* G-Research special use authorizations should limit impacts to sensitive resources, unique features, and species within the RNAs. *(RNA)* G-Research special use authorizations should limit impacts to sensitive resources, unique features, and species within recommended RNAs. *(Recommended RNA)*	
Wilderness & Primitive Area and Recommended Wilderness	All FPS

S-Objective(s) and strategies for all wildfires shall be identified. *(All)*
S-Fire management activities shall be conducted in a manner compatible with the overall wilderness management objectives (minimum impact suppression tactics). *(Wilderness and Primitive)*
S-Fire management activities shall be conducted in a manner compatible with maintaining wilderness characteristics (minimum impact suppression tactics). *(Recommended Wilderness)*
S-Human-caused disturbed areas that do not complement wilderness characteristics will be rehabilitated to a natural appearance, using species or other materials native to the area. *(All)*
G-Prescribed fire should be considered to reduce the risks and consequences of uncharacteristic wildfire within wilderness or escaping from wilderness by reducing unnatural fuel accumulations, if necessary to meet wilderness fire management objectives. Naturally occurring wildfires should be allowed to perform, as much as possible, their natural ecological role within wilderness. *(Wilderness and Primitive)*
G-Prescribed fire should be considered to reduce the risks and consequences of uncharacteristic wildfire by reducing unnatural fuel accumulations, if necessary to meet fire management objectives. Naturally occurring fires should be allowed to perform, as much as possible, their natural ecological role. *(Recommended Wilderness).*
G-Grazing of pack stock should not occur except as authorized by the district ranger when adequate forage is available. *(Wilderness and Primitive)*
G-Trails that have minimum use, detract from the wilderness character, or cannot practically be maintained or reconstructed should be obliterated *(Wilderness and Primitive)*