

Appendix B. Description of the Analysis Process

This appendix shares important features of the analysis that compared alternatives and provided information for the programmatic final environmental impact statement (FEIS).

In order to understand the ability of the Apache-Sitgreaves NFs to be managed in different ways that address resource issues, a series of analyses were performed. Much of the analysis relied on the forests' Geographic Information System (GIS) database and existing inventories. A number of analysis tools and computer models were used to help specialists understand the potential effects of management actions.

This appendix highlights some of the main analysis processes that were used in the development of this FEIS. For each resource area that is described in the FEIS, the related specialist report contains methodology and analysis descriptions. These specialist reports are available in the "Plan Set of Documents." Other key documents and evaluations (including, but not limited to, wilderness, RNA, and wild and scenic river evaluations) that served as references and laid the foundation for FEIS analyses are listed in appendix E and are available in the "Plan Set of Documents."

The appendix is organized by the following sections:

- Vegetation Modeling
- Timber Suitability Analysis and Timber Calculations
- Livestock Grazing Suitability Analysis
- Species Viability Analysis
- Socioeconomic Resources Analysis
- Research Needs

Vegetation Modeling

The vegetation analysis modeled the potential vegetation conditions resulting from natural disturbances and succession in conjunction with proposed management (mechanical, planting, and wildland fire treatments) for the alternatives. Analyses were conducted on vegetation using

potential natural vegetation types (PNVTs), existing mid-scale vegetation types¹, and soil types from the Terrestrial Ecosystem Survey².

For each PNVT, model projections were used to show the departure from desired conditions for each alternative and to estimate trends and future conditions.

Modeling projected trends in state and transitions were derived through the use of the Vegetation Dynamics Development Tool (VDDT), Version 6.0.25 (ESSA Technologies, 2006). VDDT software is a non-spatial model that allows the user to model vegetation change over time as a series of vegetation states that differ in structure, composition, and cover and to specify the amount of time it takes to move from one vegetation state to another in the absence of disturbance³.

Various disturbance agents affecting the movement of vegetation between states (or transitions) are incorporated (e.g., mechanical vegetation treatments, surface fires, mixed-severity fires, stand-replacing fires, grazing, insect outbreaks, drought events). By varying the types and rates of disturbance across the landscape, the effects of different disturbance regimes, such as historic and current fire regimes or different management treatments such as wildland fire ignitions, fire suppression, grazing practices, and mechanical fuel treatments, on vegetation can be investigated (Schussman and Smith, 2006). Input data used in modeling came directly from forest management activities and fire data over the last 25 years.

State destinations and transition probabilities for vegetation treatments were derived from Forest Vegetation Simulator (FVS) modeling, Version 6.31. FVS is a distance-independent; individual-tree forest growth model widely used in the United States and is used to compare alternatives. State destinations for natural fires and prescribed fire treatments were derived from FVS modeling, Version 2.02 and Fire and Fuel Extension (FFE) (Rebain, 2010).

Forest Inventory and Analysis (FIA) plot data were used to calibrate the VDDT model to estimate relative proportions of even- and uneven-aged conditions on the forests (Weisz et al., 2012).

¹ Mid-scale vegetation types were determined using satellite data and are mapped at the scale of 1:100,000. The mid-scale vegetation inventory for all Apache-Sitgreaves NFs' vegetation types analyzed in this report was conducted in 2005 and 2006. As a result of the 2011 Wallow Fire, the Apache-Sitgreaves NFs' mid-scale mapping product was updated to reflect changed conditions. This product represents a rapid assessment done to help identify changed vegetation condition within the perimeter of the Wallow Fire. The assessment utilized mid-scale existing vegetation data products for vegetation dominance type, tree size, and overstory canopy cover map units as well as RAVG (Rapid Assessment of Vegetation Condition after Wildfire) data produced by the Remote Sensing Applications Center (RSAC) representing overstory canopy cover mortality classes. The datasets were combined using a standard rule-set, developed by the U.S. Forest Service Southwestern Regional Office, to determine where mid-scale map units had changed according to fire severity. This outcome is intended as a rapid assessment of changed condition and does not represent an update of the official mid-scale map products.

² The terrestrial ecosystem survey referenced in this document is specific to the Apache-Sitgreaves NFs and is a classification of ecological types. It maps terrestrial ecological units based on soil types and existing vegetation (Laing et al., 1987).

³ State and transition models are simple box and arrow diagrams in which boxes represent observed or theoretical ecosystem states and arrows represent the observed or theoretical transitions among these states. These models are commonly used to conceptualize either formal mathematical models or the complex behavior of dynamic systems. They are essentially a means of mapping system behavior in the absence of adequate predictive models (Westoby et al., 1989).

Some of the drawbacks and limitations of VDDT modeling are the following:

- Many of the VDDT inputs used were derived from other modeling outputs (e.g., FVS timber harvest treatment state transition destinations and the probability of those outcomes).
- Many of the VDDT inputs used were derived from incomplete data sources such as the Forest Service Activity Tracking (FACTS⁴) database.
- VDDT is a non-spatial model intended mainly for broad scale analysis.
- VDDT projects changes in vegetative conditions in response to succession, disturbances, and management treatments; however, the VDDT model divides vegetation conditions within each PNVT into a small number of discrete states. It is acknowledged that there is more variability within each state and within nature than has been modeled for plan revision.
- A small number of states were selected because the VDDT model is driven by the data available; the amount of available data was limited.
- VDDT models the distribution of landscape states over time and does not model the more detailed physical (soil, temperature, precipitation, aspect, elevation, productivity), chemical, and biological dynamics of what is happening at each scale of spatial resolution.
- VDDT is a long-range, broad scale, strategic model and does not describe what is happening at a site-specific level of detail to individual trees, groups of trees, etc.
- VDDT does not model detailed mechanisms of landscape change, but by calibrating the VDDT models with FVS model outputs (Weisz et al., 2012), VDDT modeling takes advantage of some of the detailed mechanisms (mortality, regeneration, background dwarf mistletoe presence, natural growth, succession, etc.) that FVS considers.
- VDDT models overstory structure, composition, and cover as defined by mid-scale vegetation mapping in great detail, but does not model understory vegetation (e.g., the species composition of grasses and forbs).
- VDDT models the probability and timing of events (e.g., fire behavior, management activities, insect and disease occurrences) based on empirical observations, but our current information on historical behavior and evidence cannot accurately predict future behavior due to climate change and other phenomena which may not have occurred within the realm of the statistical evidence available.

It is assumed the disturbances (e.g., management activities) selected for the VDDT model represent the majority of disturbances the Apache-Sitgreaves NFs experience. There could be many variations to these disturbances; however these were not modeled in detail for this analysis. According to Lauenroth and Laycock (1989) and others, succession may follow multiple pathways and reach different end-points depending on the effects of disturbance on the life

⁴FACTS is a nationally supported application that tracks land based activities through the NEPA, layout, and accomplished stages of a project. It supports timber sales in conjunction with TIM Contracts and Permits, tracks and monitors NEPA decisions, tracks KV trust fund plans at the timber sale level, and generates national, regional, forest, and/or district reports. The GIS features represent the activity unit on which these activities occur and are depicted in polygons, lines or points in FACTS. Within each feature class, there exists three “subtypes” to identify the stage an activity is in (NEPA, layout, accomplished). The appropriate stage of an activity unit is determined by the status of the project.

history characteristics of the vegetation; causing predictability to be limited by the importance of chance or infrequent events.

The following PNVTs were modeled using VDDT software: ponderosa pine, wet mixed conifer, dry mixed conifer, and spruce-fir forests; Madrean pine-oak and piñon-juniper woodlands; Great Basin and semi-desert grasslands. State and transition modeling was not conducted for interior chaparral, montane/subalpine grasslands, and the four riparian PNVTs. Separate, regionally consistent VDDTs models were not developed for the montane/subalpine and riparian PNVTs.

Various spreadsheets for calculating the relative differences between alternatives for similarity to desired and reference conditions, interspersion of states, acres of aspen, and understory production as a function of overstory tree density were used for processing the output results.

- Assumption: The population and calibration of VDDT using FIA plots and FVS modeling of growth and disturbances generally represents the response of forested PNVTs well enough to compare the potential responses of alternatives in a relative way.

Goals or desired conditions used to evaluate contributions to sustainability come from the desired conditions in the proposed plan. These desired conditions are a combination of the following:

- Forest Service Southwestern Region consistent desired conditions, which were developed using an interdisciplinary process and various scientific references.
- Apache-Sitgreaves NFs specific desired conditions that supplement the Region 3 consistent desired conditions. The Apache-Sitgreaves NFs also developed desired conditions for PNVTs not addressed in the regionally-consistent process.

Additional information about the analysis process can be found in the “Vegetation,” “Forest Products,” and “Fire Specialist” reports in the “Plan Set of Documents.”

Vegetation Treatments

The following tables provide the variables that were input into individual VDDT models to determine the resulting movement toward or away from desired condition and vegetation state makeup. The input variables represent potential management activities by alternative including the acres treated mechanically, by planting, or by wildland fire. Table 179 provides a summary by PNVT and alternative. Table 180 displays more detail, including the treatment types, for the modeled PNVTs.

References

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Table 179. Summary of modeled annual treatment objectives (acres) by PNVT and alternative for the high, average, and low levels

	Alt. A			Alt. B			Alt. C			Alt. D		
	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low
Ponderosa Pine Forest (602,206 acres on NFS Land)												
Acres treated Mechanically	NA	7,119	NA	11,025	6,289	1,552	24,255	13,341	2,426	9,450	5,434	1,417
Acres treated by Planting	NA	450	NA	1,200	875	550	1,400	1,100	800	400	263	125
Acres treated by Wildland Fire	NA	3,150	NA	11,025	6,300	1,575	10,187	5,614	1,040	22,050	12,679	3,308
Total Acres Treated	NA	10,719	NA	23,250	13,464	3,677	35,842	20,055	4,266	31,900	18,376	4,850
Dry Mixed Conifer Forest (147,885 acres on NFS Land)												
Acres treated Mechanically	NA	1,808	NA	2,772	1,584	396	6,160	3,388	616	2,400	1,380	360
Acres treated by Planting	NA	100	NA	450	338	225	500	383	265	200	150	100
Acres treated by Wildland Fire	NA	800	NA	2,910	1,663	416	2,772	1,525	277	5,880	3,381	881
Total Acres Treated	NA	2,708	NA	6,132	3,585	1,037	9,432	5,296	1,158	8,480	4,911	1,341
Wet Mixed Conifer Forest (177,995 acres on NFS Land)												
Acres treated Mechanically	NA	2,147	NA	3,325	1,900	475	7,315	4,023	731	2,851	1,640	428
Acres treated by Planting	NA	325	NA	500	375	250	700	575	450	0	0	0
Acres treated by Wildland Fire	NA	950	NA	3,325	1,900	475	3,135	1,725	314	6,650	3,824	998
Total Acres Treated	NA	3,422	NA	7,150	4,175	1,200	11,150	6,323	1,495	9,501	5,464	1,426

	Alt. A			Alt. B			Alt. C			Alt. D		
	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low
Spruce-Fir Forest (17,667 acres on NFS Land)												
Acres treated Mechanically	NA	108	NA	95	55	14	208	112	16	36	21	6
Acres treated by Planting	NA	5	NA	50	35	20	10	8	5	0	0	0
Acres treated by Wildland Fire	NA	100	NA	606	347	87	892	493	93	964	555	145
Total Acres Treated	NA	213	NA	751	437	121	1,110	613	114	1,000	576	151
Madrean Pine-Oak Woodland (397,927 acres on NFS Land)												
Acres treated Mechanically	NA	0	NA	0	0	0	0	0	0	0	0	0
Acres treated by Wildland Fire	NA	1,063	NA	11,143	7,429	3,714	5,000	3,125	1,250	22,335	13,029	3,722
Total Acres Treated	NA	1,063	NA	11,143	7,429	3,714	5,000	3,125	1,250	22,335	13,029	3,722
Piñon-Juniper Woodland (222,166 acres on NFS Land)												
Acres treated Mechanically	NA	500	NA	2,341	1,561	780	4,213	2,633	1,053	4,042	2,358	673
Acres treated by Wildland Fire	NA	713	NA	1,412	941	470	600	375	150	3,443	2,009	575
Total Acres Treated	NA	1,213	NA	3,753	2,502	1,250	4,813	3,008	1,203	7,485	4,367	1,248
Great Basin Grassland (185,523 acres on NFS Land)												
Acres treated Mechanically	NA	500	NA	10,269	7,702	5,135	0	0	0	6,161	4,621	3,081
Acres treated by Wildland Fire	NA	41	NA	10,000	7,500	5,000	0	0	0	14,000	10,500	7,000
Total Acres Treated	NA	541	NA	20,269	15,202	10,135	0	0	0	20,161	15,121	10,081

	Alt. A			Alt. B			Alt. C			Alt. D		
	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low
Semi-Desert Grassland (106,952 acres on NFS Land)												
Acres treated Mechanically	NA	0	NA	0	0	0	0	0	0	0	0	0
Acres treated by Wildland Fire	NA	27	NA	3,000	2,500	2,000	0	0	0	3,000	2,500	2,000
Total Acres Treated	NA	27	NA	3,000	2,500	2,000	0	0	0	3,000	2,500	2,000
Montane/Subalpine Grasslands (51,559 acres on NFS Land) - Not Modeled in VDDT												
Acres treated Mechanically	NA	0	NA	500	500	500	500	500	500	500	500	500
Acres treated by Wildland Fire	NA	0	NA	0	0	0	0	0	0	0	0	0
Total Acres Treated	NA	0	NA	500	500	500	500	500	500	500	500	500
Riparian Forests and Areas (48,241 acres on NFS Land) - Not Modeled in VDDT												
Acres treated Mechanically	NA	0	NA	0	0	0	0	0	0	0	0	0
Acres treated by Wildland Fire	NA	0	NA	350	350	350	0	0	0	450	450	450
Total Acres Treated	NA	0	NA	350	350	350	0	0	0	450	450	450

Table 180. Acres by treatment type used to model the low and high annual treatment objectives

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
Ponderosa Pine	Average	Low	High	Low	High	Low	High
B Free thin all sizes to target BA (basal area)	1,240	396	2,814	683	6,826	11	77
C Thin from below to target BA	2,090	287	2,042	243	2,426	0	0
D Thin under 16-inch diameter to BA	1,999	0	0	0	0	1,348	8,987
E GroupSelect with matrix thin	1,370	677	4,807	1,071	10,706	50	331
F Shelterwood seed cut to target BA	420	192	1,362	429	4,297	8	55
G Clearcut with legacy trees	0	0	0	0	0	0	0
H Clearcut-Coppice	0	0	0	0	0	0	0
I Plant Seedlings	450	550	1,200	800	1,400	125	400
J RX FIRE ONLY low conditions	2,836	551	3,858	364	3,565	1,158	7,718
K RX FIRE ONLY moderate conditions	316	866	6,064	571	5,602	1,820	12,128
L RX FIRE ONLY high conditions	0	157	1,102	104	1,020	330	2,205
M Thin under 9-inch diameter to BA	0	0	0	0	0	0	0
Dry Mixed Conifer	Average	Low	High	Low	High	Low	High
B Free thin all sizes to target BA	221	19	110	20	192	0	0
C Thin from below to target BA	372	9	70	14	140	0	0
D Thin under 16-inch diameter to BA	355	0	0	0	0	0	1,193
E GroupSelect with matrix thin	244	227	1,585	380	3,961	0	0
F Shelterwood seed cut to target BA	74	23	175	60	660	0	0

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
G Clearcut with legacy trees	0	0	0	0	0	0	0
H Clearcut-Coppice	0	0	0	0	0	0	0
I Plant Seedlings	100	225	450	265	500	100	200
J RX FIRE ONLY low conditions	720	99	693	66	660	210	1,400
K RX FIRE ONLY moderate conditions	80	277	1,940	185	1,848	588	3,920
L RX FIRE ONLY high conditions	0	40	277	26	264	83	560
M Thin under 9-inch diameter to BA	542	118	832	142	1,207	360	1,207
Wet Mixed Conifer	Average	Low	High	Low	High	Low	High
B Free thin all sizes to target BA	150	14	94	26	254	0	0
C Thin from below to target BA	258	13	94	64	635	0	0
D Thin under 16-inch diameter to BA	600	0	0	0	0	0	1,973
E GroupSelect with matrix thin	450	286	2,000	346	3,423	0	80
F Shelterwood seed cut to target BA	20	3	20	21	211	0	0
G Clearcut with legacy trees	34	13	93	86	846	0	0
H Clearcut-Coppice	34	13	93	86	846	0	0
I Plant Seedlings	325	250	500	450	700	0	0
J RX FIRE ONLY low conditions	855	159	1,107	105	1,044	332	2,214
K RX FIRE ONLY moderate conditions	96	317	2,218	208	2,091	665	4,436
L RX FIRE ONLY high conditions	951	0	0	0	0	0	0
M Thin under 9-inch diameter to BA	601	133	931	102	1,100	428	798

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
Spruce-Fir	Average	Low	High	Low	High	Low	High
B Free thin all sizes to target BA	3	0	3	1	7	0	0
C Thin from below to target BA	17	0	2	0	7	0	0
D Thin under 16-inch diameter to BA	18	0	0	0	0	5	31
E GroupSelect with matrix thin	27	10	70	11	137	0	0
F Shelterwood seed cut to target BA	0	0	0	0	0	0	0
G Clearcut with legacy trees	10	1	3	1	13	0	0
H Clearcut-Coppice	17	1	3	1	13	0	0
I Plant Seedlings	5	20	50	5	10	0	0
J RX FIRE ONLY low conditions	90	28	201	31	297	48	321
K RX FIRE ONLY moderate conditions	10	58	404	62	596	97	643
L RX FIRE ONLY high conditions	0	0	0	0	0	0	0
M Thin under 9-inch diameter to BA	16	2	14	2	31	1	5
Piñon-Juniper	Average	Low	High	Low	High	Low	High
B Free thin all sizes to target BA	180	0	0	96	383	0	0
C Thin from below to target BA	0	0	0	0	0	0	0
D Thin under 16-inch diameter to BA	150	0	0	0	0	647	3,884
E GroupSelect with matrix thin	40	780	2,341	957	3,830	26	158
F Shelterwood seed cut to target BA	0	0	0	0	0	0	0
G Clearcut with legacy trees	130	0	0	0	0	0	0

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
H Clearcut-Coppice	0	0	0	0	0	0	0
I Plant Seedlings	0	0	0	0	0	0	0
J RX FIRE ONLY low conditions	81	0	0	0	0	0	0
K RX FIRE ONLY moderate conditions	9	470	1,412	150	600	575	3,443
L RX FIRE ONLY high conditions	0	0	0	0	0	0	0
M Thin under 9-inch diameter to BA	0	0	0	0	0	0	0
Madrean Pine-Oak	Average	Low	High	Low	High	Low	High
B Free thin all sizes to target BA	0	0	0	0	0	0	0
C Thin from below to target BA	0	0	0	0	0	0	0
D Thin under 16-inch diameter to BA	0	0	0	0	0	0	0
E GroupSelect with matrix thin	0	0	0	0	0	0	0
F Shelterwood seed cut to target BA	0	0	0	0	0	0	0
G Clearcut with legacy trees	0	0	0	0	0	0	0
H Clearcut-Coppice	0	0	0	0	0	0	0
I Plant Seedlings	0	0	0	0	0	0	0
J RX FIRE ONLY low conditions	797	0	0	0	0	0	0
K RX FIRE ONLY moderate conditions	266	3,714	11,143	1,250	5,000	3,722	22,335
L RX FIRE ONLY high conditions	0	0	0	0	0	0	0
M Thin under 9-inch diameter to BA	0	0	0	0	0	0	0

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
Great Basin Grassland	Average	Low	High	Low	High	Low	High
B Free thin all sizes to target BA	0	0	0	0	0	0	0
C Thin from below to target BA	0	0	0	0	0	0	0
D Thin under 16-inch diameter to BA	0	0	0	0	0	0	0
E GroupSelect with matrix thin	0	0	0	0	0	0	0
F Shelterwood seed cut to target BA	0	0	0	0	0	0	0
G Clearcut with legacy trees	250	5,135	10,269	0	0	3,081	6,161
H Clearcut-Coppice	250	0	0	0	0	0	0
I Plant Seedlings	0	0	0	0	0	0	0
J RX FIRE ONLY low conditions	0	0	0	0	0	0	0
K RX FIRE ONLY moderate conditions	41	5,000	10,000	0	0	7,000	14,000
L RX FIRE ONLY high conditions	0	0	0	0	0	0	0
M Thin under 9-inch diameter to BA	0	0	0	0	0	0	0
Semi-Desert Grassland	Average	Low	High	Low	High	Low	High
B Free thin all sizes to target BA	0	0	0	0	0	0	0
C Thin from below to target BA	0	0	0	0	0	0	0
D Thin under 16-inch diameter to BA	0	0	0	0	0	0	0
E GroupSelect with matrix thin	0	0	0	0	0	0	0
F Shelterwood seed cut to target BA	0	0	0	0	0	0	0
G Clearcut with legacy trees	0	0	0	0	0	0	0

PNVT	Alternative A	Alternative B		Alternative C		Alternative D	
H Clearcut-Coppice	0	0	0	0	0	0	0
I Plant Seedlings	0	0	0	0	0	0	0
J RX FIRE ONLY low conditions	0	0	0	0	0	0	0
K RX FIRE ONLY moderate conditions	27	1,333	2,000	0	0	1,333	2,000
L RX FIRE ONLY high conditions	0	667	1,000	0	0	667	1,000
M Thin under 9-inch diameter to BA	0	0	0	0	0	0	0

Timber Suitability Analysis

The provisions of the 1982 Planning Rule require lands which are not suited for timber production to be identified. Timber production is the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use. The term timber production does not include production of firewood.

An analysis was completed to determine the acres suitable and not suitable for timber production on the Apache-Sitgreaves NFs. This analysis was completed in three main steps to determine (1) the lands tentatively suitable for timber production; (2) the cost efficiency of meeting forest objectives, including timber production; and (3) the lands suitable for timber production by alternative. The analysis process and results are summarized and displayed below.

The forests followed guidance set forth by the Southwestern Region guidance (Forest Service, 2009), National Forest Management Act, and provisions of the 1982 Planning Rule for determining suitability. Further descriptions of the analysis process can be found in the “Forest Products” section of this FEIS and the “Forest Products Specialist Report” (Forest Service, 2014) in the “Plan Set of Documents.”

Step 1: Lands Tentatively Suitable for Timber Production

Tentatively suitable acres were based on the following criteria (table 181). Starting with the entire Apache-Sitgreaves NFs, GIS data was used to overlay and subtract the features listed below. The analysis resulted in 808,368 acres that were carried forward into the next step of the suitability process. Alternative A resulted in a slightly different tentatively suitable acreage (807,289 acres) because more lands were in the research natural area category (1,882 acres).

Table 181. Criteria and acres used to identify lands as tentatively suitable for timber production

Tentatively Suitable Lands	Acres	Total Acres
Total Apache-Sitgreaves NFs		2,110,196
Non-NFS Land	94,844	
Total NFS Lands		2,015,352
Non-forest Lands		
Areas not defined as forest land (>10% at maturity)	4,250	
Quarry, urban/agriculture, water		
Grasslands	344,033	
Great Basin, montane/subalpine, semi-desert		
Woodlands	617,094	
Madrean pine-oak, piñon-Juniper		
Interior chaparral	55,981	
Wetland/cienega riparian areas	17,900	
Lands withdrawn from timber production		
Designated Wilderness	20,628	
Bear Wallow, Escudilla, Mount Baldy		
Blue Range Primitive Area	43,258	
Research Natural Area	219	
Eligible or suitable wild and scenic river segments classified as wild	23,085	
Irreversible resource damage likely		
Unsuited/unstable soils (sensitive and unstable)	23,952	
Inadequate restocking		
Low reforestation potential based on soil properties	56,584	
Lands Tentatively Suitable for Timber Production		808,368

The above table reflects the same step 1 common to all action alternatives.

Acres of “unsuited/unstable soils” and “low reforestation potential” were derived from the “Apache-Sitgreaves NFs Terrestrial Ecosystem Survey” (Laing et al., 1987). They were not modified after the 2011 Wallow Fire, because the forest soil scientist believes it is too early (in 2012) to determine accurate estimates of soil productivity losses due to fire consumption of the organic layers and/or subsequent erosion of topsoil. The fire area soils, watersheds, and ground cover have not yet stabilized post-burn. This is a site-specific determination that is made at the

project-level and based on soils monitoring over time. Any estimates made of possible site conversion from forested PNVTs to grass/rock/shrubland in the “Forest Products Specialist Report” (Forest Service, 2014) for this analysis are purely estimates based on a search of relevant literature, which also require onsite monitoring for validation.

Adjustments to the suitable timberland acreage within the Wallow Fire and other high severity fires may be appropriate in the next 10 years during the scheduled review and update of the forest suitability classification process.

Step 2: Cost Efficiency Analysis

Alternative D was not analyzed for timber harvest economic efficiency because of the alternative theme and its incompatibility with regulated timber production.

The tentatively suitable land for Alternatives A, B, and C was categorized into four strata using GIS:

1. Roaded tractor operable (slopes under 40 percent with an existing road system in place);
2. Unroaded tractor operable (slopes under 40 percent but with no roads existing, thus requiring new construction);
3. Cable/helicopter operable (steep slopes over 40 percent with roads close enough to serve for cable yarding and/or short-turn helicopter yarding);
4. Too isolated or too small to log (areas of otherwise operable ground, but in isolated locations such that logging is impractical).

Stratum 4 was removed from further considerations because logging would be impractical. Alternative A (1987 plan) did not account for these same strata.

Acres of spruce-fir forest were not analyzed in this step because they are located inside lands withdrawn for timber production, are on sensitive/unstable soils, and/or are included in strata 4 above.

Economic efficiency spreadsheets developed by the U.S. Forest Service Washington Office were used to generate the cost efficiency outputs. All economic efficiency analysis spreadsheets are on file in the Plan Set of Documents. The operability costs associated with ponderosa pine, dry mixed conifer, and wet mixed conifer including market revenue values and associated costs, of strata 1 through 3 were input to determine present net values and benefit:cost ratios. Table 182 displays the financial results.

Table 182. Net revenue, present net value, and benefit:cost ratio for ponderosa pine and dry mixed conifer for strata 1 to 3

Stratum	PNVT	Undiscounted Net Revenue	Present Net Value at 3% Discount	Benefit:Cost Ratio at 3% Discount
1	Ponderosa Pine	-\$6,558/acre	-\$1,473/acre	0.0190
1	Dry Mixed Conifer	-\$6,666/acre	-\$1,509/acre	0.0185
1	Wet Mixed Conifer	-\$7,264/acre	-\$1,687/acre	0.0141
2	Ponderosa Pine	-\$6,770/acre	-\$1,637/acre	0.0171
2	Dry Mixed Conifer	-\$7,304/acre	-\$1,785/acre	0.0157
2	Wet Mixed Conifer	-\$7,834/acre	-\$1,970/acre	0.0121
3	Ponderosa Pine	-\$19,912/acre	-\$4,580/acre	-0.0479
3	Dry Mixed Conifer	Not modeled	NA	negative
3	Wet Mixed Conifer	Not modeled	NA	negative

Benefit:cost ratios for strata 1 and 2 in all three PNVTs are low but positive, while the value for stratum 3 is negative. There was no need to model dry mixed conifer and wet mixed conifer in stratum 3, because they have benefit:cost ratios more negative than the ponderosa pine result, are on steep slopes, and are MSO protected habitat that has management requirements which conflict with timber harvest. Any species mix harvested in the dry mixed conifer and wet mixed conifer brings lower market sale value than ponderosa pine, while the costs of operating in these two PNVTs are higher than the ponderosa pine costs. The excessively high costs to manage a regulated timber production program associated with stratum 3 (cable/helicopter operable lands) on all PNVTs were considered cost-prohibitive and were removed from further consideration.

Forest Service roads budgets have been declining dramatically. Less than 10 miles of new NFS road construction has been done in the past 5 years, and this trend is expected to continue. Additive costs of deferred maintenance roads in stratum 1, combined with new construction roads and future maintenance for stratum 2 under current budget trends, would also make stratum 2 cost-inefficient for this planning period.

Although there are short-term costs associated with stratum 1, long-term benefits of treatments include fewer acres of trees/timber and wildlife habitat lost to uncharacteristic fire, better tree growth rates and overall forest health, and greater resiliency to climate change. There are also benefits associated with contributions to the local economy through a steady flow of timber products.

It was determined that 0 (zero) acres in alternative A, 69,590 acres in alternative B, and 85,234 acres in alternative C are not economically cost efficient. These acres were subtracted from the tentatively suitable land base and not carried forward to the next step.

Step 3: Lands Suitable for Timber Production

The final step in the suitability evaluation was to apply any remaining criteria identified in chapter 4 Suitability of the proposed plan. These criteria (table 183) include lands where management objectives limit timber harvest (e.g., Recommended Wilderness Management Area, Mexican spotted owl (MSO) protected lands). GIS was used to identify the not suitable areas.

Accessible and operable acres in alternative D are not available for commercial timber production, due to this alternative's emphasis on using one single cutting entry, with maintenance by natural processes (e.g., fire) thereafter. Therefore, due to the intentional design of alternative D, all 808,368 acres of tentatively suitable lands are not appropriate for timber production and no economic or further suitability analysis was needed.

Table 183. Lands suitable or not suitable for timber production

Area	Suitable	Not Suitable
General Forest Management Area	X	
Community-Forest Intermix Management Area	X	
High Use Developed Recreation Area Management Area		X
Energy Corridor Management Area		X
Wild Horse Territory Management Area	X	
Wildlife Quiet Area Management Area	X	
Natural Landscape Management Area		X
Recommended Research Natural Area Management Area		X
Research Natural Area Management Area		X
Primitive Area Management Area		X
Recommended Wilderness Management Area		X
Wilderness Management Area		X
Communications sites		X
Developed recreation and administrative sites		X
Eligible or suitable wild and scenic river corridors		X
MSO protected lands		X

Since management areas change by alternative, the resultant acres identified as suitable for timber production vary. These are identified in the results section below.

Results

The following tables (table 184, table 185, and table 186) display the criteria and resulting acres considered to be suitable for timber production by alternative. Differences in final acres of suitable timberlands between the alternatives are a result of different reductions shown from the tentatively suitable lands due to the differing theme of each alternative.

Table 184. Alternative A timber production suitability determination

	PNVT Acres	Acres	Subtotal Acres	Total Acres
Total Apache-Sitgreaves NFS Land				2,015,352
Lands Tentatively Suitable for Timber Production				807,289
Lands where Management Area Prescriptions Precludes Timber Production			12,258	
Special Management Areas, Energy Corridor, and Water		12,258		
Lands where Management Objective Limit Timber Harvest			30,159	
Riparian		19,407		
Eligible or suitable wild and scenic river corridors classified as recreational or scenic		10,752		
Lands not economically cost efficient			0	
The 1987 plan did not limit suitable acres to cost efficient lands		0		
Lands Not Appropriate for Timber Production				42,417
Lands Suitable for Timber Production (38 percent of NFS land)		764,872		764,872
Dry mixed conifer	108,208			
Ponderosa pine	503,412			
Spruce-fir	5,180			
Wet mixed conifer	148,072			
Lands Not Suitable for Timber Production (62 percent of NFS land)				1,250,480

Table 185. Alternative B timber production suitability determination

	PNVT Acres	Acres	Subtotal Acres	Total Acres
Apache-Sitgreaves NFS Land				2,015,352
Lands Tentatively Suitable for Timber Production				808,368
Lands where Management Area Prescriptions Precludes Timber Production			65,497	
High Use Developed Recreation Area, Energy Corridor, Natural Landscape, Recommended Research Natural Area, and Recommended Wilderness Management Areas		65,497		
Lands where Management Objective Limit Timber Harvest			76,537	
Riparian		15,696		
Communications sites		91		
Developed recreation sites and administrative sites		5,862		
Eligible or suitable wild and scenic river corridors classified as recreational or scenic		8,258		
Mexican spotted owl protected lands (PACs)		46,630		
Lands not economically cost efficient			69,590	
Steep slope but loggable		54,466		
Dry mixed conifer	18,631			
Ponderosa pine	6,327			
Spruce-fir	2,548			
Wet mixed conifer	26,960			
Unroaded areas		12,511		
Dry mixed conifer	1,292			
Ponderosa pine	9,589			
Spruce-fir	32			
Wet mixed conifer	1,598			
Too isolated or too small to log		2,613		
Lands Not Appropriate for Timber Production				211,624
Lands Suitable for Timber Production (30 percent of NFS land)		596,743		596,744*
Dry mixed conifer	65,086			
Ponderosa pine	445,440			
Wet mixed conifer	86,217			
Lands Not Suitable for Timber Production (70 percent of NFS land)				1,418,608

* Difference from subtotal due to rounding

Table 186. Alternative C timber production suitability determination

	PNVT Acres	Acres	Subtotal Acres	Total Acres
Apache-Sitgreaves NFS Land				2,015,352
Lands Tentatively Suitable for Timber Production				808,368
Lands where Management Area Prescriptions Precludes Timber Production			27,321	
High Use Developed Recreation Area, Energy Corridor, Natural Landscape, Recommended Research Natural Area, and Recommended Wilderness Management Areas		27,321		
Lands where Management Objective Limit Timber Harvest			91,067	
Riparian		19,927		
Communications sites (buffer to 5 acres)		94		
Developed recreation sites and administrative sites		6,341		
Eligible or suitable wild and scenic river corridors classified as recreational or scenic		12,174		
Mexican spotted owl protected lands (PACs)		52,531		
Lands not economically cost efficient			85,234	
Steep slope but loggable		62,261		
Dry mixed conifer	21,415			
Ponderosa pine	8,731			
Spruce-fir	3,086			
Wet mixed conifer	29,029			
Unroaded areas		13,637		
Dry mixed conifer	1,295			
Ponderosa pine	10,381			
Spruce-fir	82			
Wet mixed conifer	1,879			
Too isolated or too small to log		9,336		
Lands Not Appropriate for Timber Production				203,622
Lands Suitable for Timber Production (30 percent of NFS lands)		604,746		604,746
Dry mixed conifer	65,778			
Ponderosa pine	451,179			
Wet mixed conifer	87,789			
Lands Not Suitable for Timber Production (70 percent of NFS lands)				1,410,606

For alternatives B and C all acres of spruce-fir forest were classified as non-suitable because they are located inside withdrawn lands, are too isolated or small to log, and/or are in MSO protected habitat. Some acres of spruce-fir forest were classified as suitable timberlands in the 1987 plan.

MSO protected activity centers (PACs) were eliminated as “lands where management objectives limit timber harvest” due to a 9-inch diameter cutting cap limitation required by the current “MSO Recovery Plan” (USFWS, 2012). Additional MSO protected habitat on steep slopes outside of PACs was further eliminated as not cost-efficient to harvest. Care was taken to avoid double-counting these acreage deductions when more than one reason exists for the deduction. Should the “MSO Recovery Plan” be revised during this planning period, changes in timberland suitability classification may need to be reviewed and adjusted accordingly.

Timber Calculations

The “Forest Products Specialist Report” and report appendices (Forest Service, 2014) in the “Plan Set of Documents” provides complete records of all assumptions, rationale, data sources, methodologies, and references used to estimate timber volumes by alternative. The following is a brief summary of how the ASQ, LTSYC, and nonindustrial wood volumes were derived.

All wood volumes cut under each alternative are considered as byproducts of vegetation restoration treatments that maintain or move toward desired conditions. The PNVTs from which wood could be cut that were modeled in VDDT include ponderosa pine forest, dry mixed conifer, wet mixed conifer forests, spruce-fir forest, piñon-juniper woodland, and Great Basin grassland.

Two models were used to estimate volumes of wood cut under each alternative: (1) Forest Vegetation Simulator (FVS) and (2) Vegetation Dynamics Development Tool (VDDT). Various cutting simulations modeled in the FVS were used by the U.S. Forest Service Southwestern Region to produce estimates of three product categories: cubic feet per acre of industrial timber, and nonindustrial firewood cut, as well as tons of biomass per acre resulting from proposed restoration treatments (Weisz et al., 2012). The per-acre estimates from FVS were then incorporated into the VDDT model as another outcome attribute for the first 5 decades of treatments simulated for each PNVt, and expanded for multiple acres cut in each alternative.

The resulting VDDT wood volumes were entered into MS Excel spreadsheets for further summation of the three different wood product categories, as estimates for treated acres of both suitable timberlands and non-suitable timberlands. Those volumes only represent green trees expected to be cut and offered to markets under plausible cutting methods to implement each alternative. The same average volume estimate of green and dead poles, posts, firewood, power line corridor/roadside hazard tree salvage small sales, and other wood products sold annually under personal and commercial use permits to meet local public demand (not modeled in VDDT) was also included in the total volume estimated for each alternative.

ASQ Volume Calculations

Only volumes of industrial conifer timber species and commercial sizes cut from suitable timberlands, and used as logs, bolts, or roundwood (excluding firewood) are included in the ASQ calculation. See the “Forest Products Specialist Report” (Forest Service, 2014) for industrial definitions and tree species included. Because the modeling only represents one possible green-tree cutting scenario under each alternative, the resulting volume outputs are too precise for a

forestwide programmatic assessment. Therefore, all ASQ values have been rounded to the nearest thousand CCF.

According to the National Forest Management Act (NFMA), dead salvage volume of wildfire-killed and insect/disease-killed trees from suitable timberlands does not contribute to the ASQ. Because such volume may be unpredictable and highly variable, it is an additional volume that can be offered above the ASQ.

LTSYC Calculations

When a forest has achieved the desired regulated condition, the basic concept of long-term sustained yield is that annual harvest levels should cut no more than the net annual growth. Net growth is gross growth less natural mortality. In cases when net growth volume exceeds total cut volume, an excess of overgrowth poses an imbalance in the ecosystem that eventually is not sustainable. Such an imbalance can contribute to higher risks of severe stand-replacement wildfire, and outbreaks of insect or disease species which capitalize on trees weakened by overcrowding. Figure 83 below illustrates this concept.

Long term sustained yield capacity (sustainable harvest) for suitable timberlands was determined for each alternative using the following formula:

$$\text{LTSYC} = (24 \text{ cubic feet /acre/year of net growth}) \times (\text{number of suitable timberland acres in the alternative})$$

The net growth volume per acre per year is based on an average 30-year re-entry cutting cycle modeled in FVS for each forested PNVT by the USFS Southwestern Region as the ideal timeframe to maintain desired forest conditions stated in the proposed plan and for implementing an uneven-aged cutting system to reach forest regulation for sustained harvest yields (Youtz and Vandendriesche, 2012).

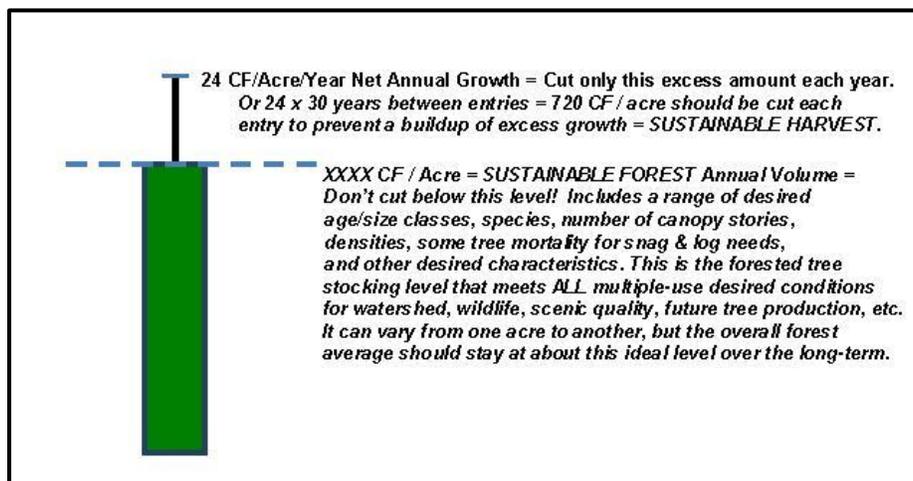


Figure 83. Conceptual diagram of ideal cutting level for a sustainable forest and sustainable harvest (not drawn to any scale)

For simplification of analysis, the long-term sustained yield of 24 cubic feet per acre per year used is a rounded, weighted average value for all suitable timberlands, using the regional model

run results for each PNVT, based on the proportional acres of each forested PNVT present on the Apache–Sitgreaves NFs suitable land base. Only the Southwestern Region’s high-site model run for the ponderosa pine/grass type was used in this calculation, because soils not capable of producing at least 20 cubic feet/acre/year (approximately site index of 70 or greater) were eliminated from the tentatively suitable land base with the Apache-Sitgreaves NFs’ soils assessment (see the “Forest Products Specialist Report” (Forest Service, 2014)). Because acres of suitable timberland vary by PNVT, a weighted average was used to verify the correct average to be used for all analyses of all PNVTS combined. Table 187 shows how this average was derived mathematically.

Table 187. Average LTSY calculation for all suitable timberland PNVTS on the Apache-Sitgreaves NFs by alternative

PNVT	Suitable Acres ^a	LTSY in cubic feet/acre/year ^b	Multiplication Product
Alternative A			
Ponderosa Pine ^c	503,412	23.6	11,880,523
Dry Mixed Conifer	108,208	22.9	2,477,963
Wet Mixed Conifer	148,072	24.7	3,657,378
Spruce-Fir	5,180	0	0
Totals	764,872	71.2	18,015,864
Weighted Average:	18,015,864 / 764,872 =	23.6, rounded to 24	cubic feet/acre/year
Alternative B			
Ponderosa pine ^c	445,440	23.6	10,512,384
Dry Mixed Conifer	65,086	22.9	1,490,469
Wet Mixed Conifer	86,217	24.7	2,129,560
Spruce-Fir	0	0	0
Totals	596,743	71.2	14,132,413
Weighted Average:	14,132,413 / 596,743 =	23.7, rounded to 24	cubic feet/acre/year
Alternative C			
Ponderosa pine ^c	451,179	23.6	10,647,824
Dry Mixed Conifer	65,778	22.9	1,506,316
Wet Mixed Conifer	87,789	24.7	2,168,388
Spruce-Fir	0	0	0
Totals	604,746	71.2	14,322,528
Weighted Average:	14,322,528 / 604,746 =	23.7, rounded to 24	cubic feet/acre/year

^a See the “Forest Products Specialist Report” (Forest Service, 2014), appendix A-2 for additional information.

^b From Youtz and Vandendriesche, 2012.

^c Only the regional ponderosa pine/grass type high site index LTSY model result was used.

Because this net growth average of 24 cubic feet per acre per year does not vary by alternative, it was used in all LTSYC calculations for all alternatives in FEIS chapter 3, table 149.

To comply with legal direction of the National Forest Management Act (NFMA) and Multiple Use-Sustained Yield Act (MUSYA), long-term sustained yield also means that ASQ volumes harvested from suitable timberlands cannot decline from one decade to the next. Ideally, harvest volumes below the LTSYC should continue increasing to eventually reach the LTSYC and then level off at or near that regulated value. The only exception to this rule is if the cutting volumes are departed above the LTSYC, in which case they would be expected to decline toward the LTSYC over time.

Alternative A's ASQ volumes for decades 1 through 5 are all within 1 to 2 percent of each other, which indicates a flat line of sustained yield harvests. VDDT methodology used in this analysis did not permit the ability to model the most logical changes in cutting methods for subsequent re-entries on acres previously treated with the model inputs. By decade three, less intermediate thinning treatments to cut smaller sized trees would be used; instead more uneven-aged group selection cuts which require cutting bigger trees would be used, thus producing greater harvest volumes than those shown here for decades 3 through 5.

Alternatives A and B comply with legal requirements by cutting at levels which do not decline and are below the LTSYC. The first five decades of VDDT modeling do not produce substantially increasing harvest volumes that ramp up closer to the LTSYC, due to predicted cutting levels on suitable timberlands according to budget and workforce estimates for these alternatives in this planning period.

ASQ cutting departures above the LTSYC can be temporarily justified to correct the imbalance of excess net growth, provided the volumes cut decline over time to eventually level out at or below the LTSYC. This is the case for Alternative C. This declining volume trend came from the VDDT model runs for decades 1 through 5 and is based on treatment inputs for each alternative that are documented in the "Forest Products Specialist Report" (Forest Service, 2014). A declining trend is logical when heavy restoration cuts are needed early to prevent excessive tree mortality from high severity wildfires, competition, and insect/disease outbreaks. Once overgrowth levels have been reduced, then subsequent decades should produce volumes which taper down toward reaching desired conditions that are intended to promote a more sustainable forest. Because VDDT modeling was not done beyond 50 years, it is assumed that continued aggressive cutting levels beyond decade five would be needed to bring forested conditions closer to desired conditions and the LTSYC.

Alternatives A and C were found to comply with the non-declining even flow legal direction by continuing the same treatment strategy each decade in the initial level of VDDT modeling. In the case of alternative B, however, the initial VDDT model runs which repeated the same treatment strategy in subsequent decades after this planning period produced ASQ volumes that consistently declined each decade, while staying below the LTSYC. Therefore, additional analysis at a more refined level of modeling revealed that treatment strategy would need to change after the 15-year planning period for alternative B.

In order to sustain a non-declining even flow of ASQ volumes on suitable timberlands in alternative B, additional modeling revealed that the restoration strategy for decades 2 through 5 would need to do the following: increase treatment acreages in closed canopy transition vegetation states in the ponderosa pine and dry mixed conifer PNVTs; and shift to using low-severity prescribed fire as a maintenance tool for thinning just the seedling/sapling sizes.

These modeling shifts represent adaptive management that is predictable because as more acres are restored to desired open-canopy in these two PNVTs, cuts in each transition state would produce less volume per acre; thus the need to cut more acres overall to sustain the same total volume yields. Likewise, using moderate-high severity fire as a thinning tool would predictably reduce measurable volume available for ASQ harvest. Thinning only seedlings/saplings that have very little measurable wood volume by using only low-severity fire would not impact available ASQ volume.

These shifts in management methodology could begin after the planning period. It is assumed that continued restoration treatments toward desired conditions beyond decade five would eventually bring alternative B ASQ levels up closer to the LTSYC, provided uncharacteristic disturbances don't occur first to drastically alter the trends shown in this analysis.

Base Sale Schedule

The provisions of the 1982 Planning Rule call for a base sale schedule, or timber sale schedule. This planning effort emphasizes proposed management outcomes rather than outputs. The desired outcome is to restore the forested PNVTs toward desired ecological conditions, while also providing wood products to the economy as a byproduct of the restoration activities. Therefore, listing site-specific volume outputs tied to individual sales for each of ten years is not appropriate to provide here as a forest program target. The action alternatives offer a flexible range of annual cutting volumes, based on the realistic objective levels that help to frame the alternative. Annual volume levels offered for sale would vary as budgets, market demand, and opportunities occur.

For example, the annual cutting level for alternative B may vary from one year to the next between the high and low range of ASQ volumes shown in the FEIS chapter 3 table 148 (ASQ volume from suitable timberlands for the first decade), provided the decade total does not exceed the annual average times ten. Therefore, forestwide ASQ cutting volumes could fluctuate between 122,000 CCF and 26,000 CCF each year, provided that the total maximum volume of all cuts in the decade would not exceed 736,000 CCF for the 10-year total ASQ.

ASQ volumes from suitable timberlands only constitute a fraction of the total wood products that would result from cutting treatments implemented to restore forested acres toward the ecological desired conditions. In reality, a majority of industrial tree species in the traditional sawtimber, pulp, and pole size classes are no longer sold as these products. Many are currently sold as firewood, and/or extracted from the forest and scaled as tons of biomass, which are not included in the definition of ASQ volume. This trend is expected to increase, as the nation continues to emphasize alternative energy (heat and electricity) generation from green biomass fuel. The 4FRI contract identifies traditional sawtimber, roundwood products, and biomass offerings which all can be provided from a mix of suitable and non-suitable timberlands on the Apache-Sitgreaves NFs.

Non-ASQ Volume Calculations

All sizes of industrial conifer species cut on lands classified as non-suitable timberlands were also estimated from VDDT model runs, and tabulated as cubic feet of non-ASQ wood volume. Non-commercial sizes of industrial species cut from both suitable and non-suitable timberlands were tabulated as tons of biomass. Woodland species cut from both suitable timberlands and non-

suitable lands were tabulated as cubic feet of firewood. These non-ASQ volumes would be available for market and public offerings.

Total Wood Products

The total of all wood products of all categories potentially available to offer markets in the first decade was tabulated for each alternative, by high and low treatment objective levels in table 188.

Table 188. Estimated ranges of annual wood product volumes potentially available to offer in decade 1, by alternative from all NFS lands (suitable and non-suitable timberlands)

Product Class	Alt. A	Alt. B		Alt. C		Alt. D	
	Average	High	Low	High	Low	High	Low
Cuts on Suitable Lands							
ASQ Industrial Species^a (Timber 9+” and Pulp 5-9”) in CCF	74,392	121,591	25,585	268,353	38,522	0	0
Firewood (5+” non-industrial conifer and hardwood species) in CCF, Non-ASQ	14,606	17,530	8,533	33,615	10,019	0	0
Biomass (0+” non-industrial sizes and species) in Tons, Non-ASQ	323,302	400,667	59,336	1,202,219	128,463	0	0
Cuts on Non-suitable Lands							
Non-ASQ Industrial Species (Timber 9+” and Pulp 5-9”) in CCF	5,780	17,804	2,959	31,192	3,402	48,403	6,065
Firewood^b (5+” non-industrial conifer and hardwood species) in CCF, Non-ASQ	10,976	76,528	46,633	18,413	8,699	59,438	32,203
Biomass (0+” non-industrial sizes and species) in Tons, Non-ASQ	24,822	185,132	82,848	122,548	13,418	246,798	66,026
Summary of Total Cuts on All Treated Lands (ASQ and Non-ASQ Combined)							
Industrial Species^a (Timber 9+” and Pulp 5-9”) in CCF	80,172	139,395	28,544	299,545	41,924	48,403	6,065
Firewood^b (non-timber conifer and hardwood species) in CCF	25,582	94,058	55,166	52,028	18,718	59,438	32,203
Biomass (non-industrial sizes and species) in Tons Or Converted to CCF ^c	348,124 or 99,464	585,799 or 167,371	142,184 or 40,624	1,324,767 or 378,505	141,881 or 40,537	246,798 or 70,514	66,026 or 18,865
Grand Total of All Wood Products, All in CCF	205,218	400,824	124,334	730,078	101,179	178,355	57,133
Averaged Grand Total of All Wood Products, All in CCF	205,218	262,579	262,579	415,629	415,629	117,744	117,744

^a Industrial species for all alternatives include different live trees modeled in VDDT for restoration cutting, plus additional constant volume sold in small sales and on TIM permits (miscellaneous live and dead small salvage sales, road and recreation site hazard trees, pulp and poles).

^b Firewood for all alternatives is different live trees modeled for restoration cutting plus additional constant TIM permit sales for dead/down firewood sales, plus posts sold in TIM.

^c Conversion factor used: 3.5 tons = 1 CCF. Source: R3 Measurements Specialist, based on R3 weight scale study conducted locally.

The table above is the source for table 150 in the FEIS chapter 3, and shows how those volumes were further summarized for FEIS display. The same alternative averaged grand total volumes in the table above are shown in figure 84.

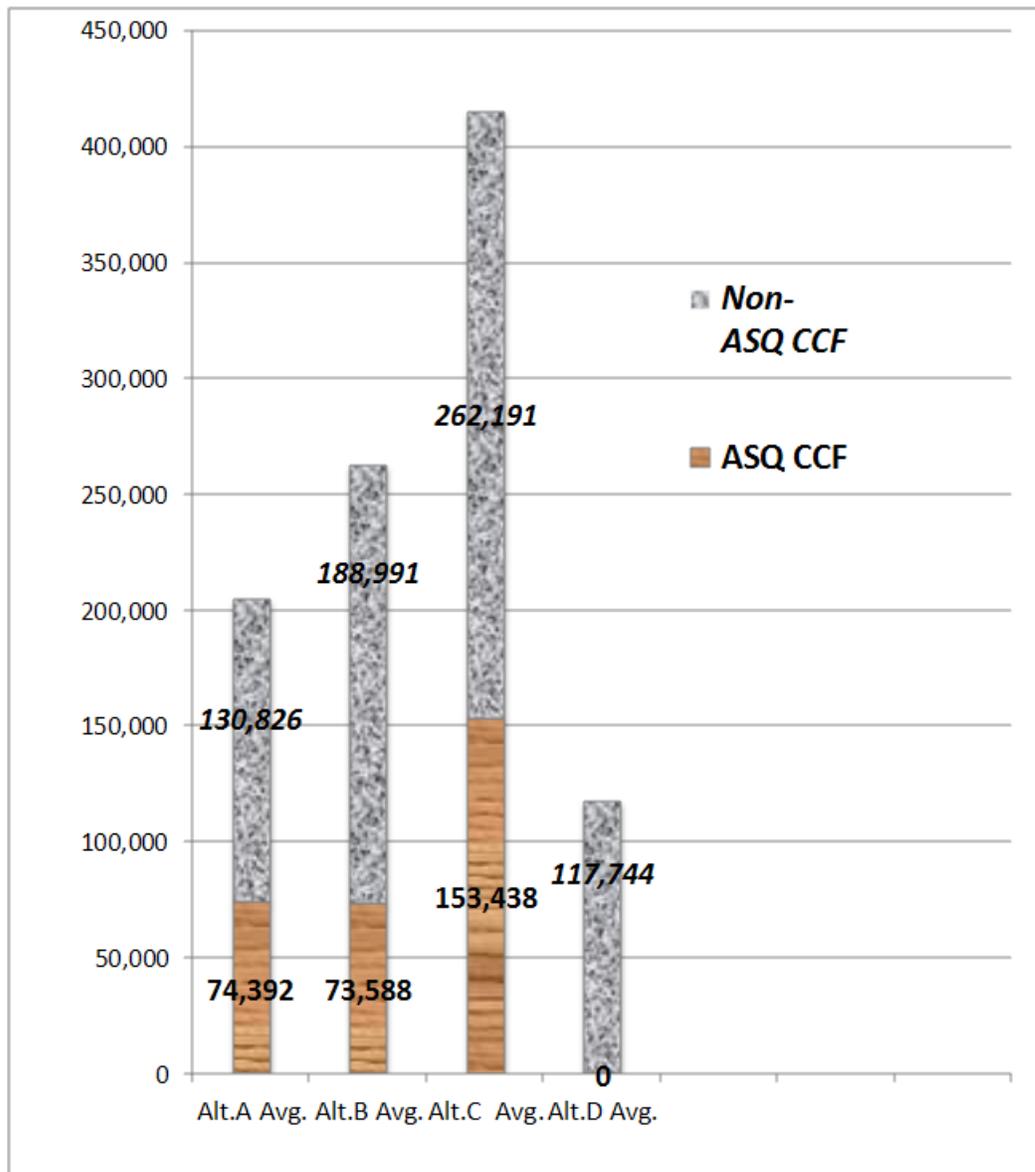


Figure 84. Total annual wood product volume estimates for decade 1 (from both suitable and non-suitable timberlands)

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Livestock Grazing Suitability Analysis

Provisions of the 1982 Planning Rule require that the capability and suitability for producing forage for grazing animals on NFS lands be determined. The analysis process and results are discussed in the following sections.

Capability is the potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology, as well as the application of management practices, such as silviculture, wildland fire, or insect and disease treatments.

Suitability is the appropriateness of applying certain resource management practices to a particular area of land, in consideration of relevant social, economic, and ecological factors. A unit of land may be suitable for a variety of individual or combined management practices.

Capability

Capability to produce forage for grazing animals was originally determined in the 1980s during the development of the 1987 plan and was based on individual allotment data. Landscape scale conditions that determine capability have not changed since the first evaluation. The Analysis of

the Management Situation (1983) and the Environmental Impact Statement (1987) document the analysis of grazing capability and suitability for the 1987 plan.

Suitability

Suitable rangeland is that which is appropriate for the activity of livestock grazing in consideration of relevant social, economic, and ecological factors. Suitable rangeland is determined based on compatibility with desired conditions and objectives in the plan area. Lands within the plan area are not identified as suitable for a certain use if that use is prohibited by law, regulation, or policy; would result in substantial and permanent impairment of the productivity of the land or renewable resources; or if the use is incompatible with the desired conditions for the relevant portion of the plan area.

An identification of an area as suitable for a particular use does not mean that the use will occur over the entire area. Likewise, identifying that a particular use is not suitable in a management area does not mean that the use will not occur in specific areas. The identification of an area as suitable for various uses is guidance for project and activity decision-making and is not a resource commitment or final decision approving projects and activities. Final decisions on resource commitments are made at the project level.

To identify the lands suitable for livestock grazing, additional criteria (table 189) from chapter 4 Suitability of the proposed plan were used.

Table 189. Lands suitable or not suitable for livestock grazing

Management Area	Suitable for Livestock Grazing	Not Suitable for Livestock Grazing
General Forest	X	
Community-Forest Intermix	X	
High Use Developed Recreation Area	X	
Energy Corridor	X	
Wild Horse Territory	X	
Wildlife Quiet Area	X	
Natural Landscape	X	
Recommended Research Natural Area		X
Research Natural Area		X
Primitive Area	X	
Recommended Wilderness	X	
Wilderness	X	
Other Areas		
Active and vacant grazing allotments	X	
Current National Forest System land not in a grazing allotment		X

Results

Table 190 displays the acres of land that are suitable for livestock grazing in alternative A and table 191 displays the action alternatives. To calculate the acres suitable for livestock grazing in the action alternatives, GIS was used to subtract areas not in an allotment, the Black River Conservation Area, and the designated and recommended research natural areas. The 1987 plan was used as the baseline to identify lands suitable for livestock grazing in alternative A.

Table 190. Alternative A acres suitable for livestock grazing as identified in the 1987 plan

Management Area	Acres
1: Forest Land	836,288
2: Woodland	611,025
3: Riparian	6,870
4: Grasslands	243,126
5: Developed Recreation Site	0
7: Mount Baldy Wilderness	7,079
8: Blue Range Primitive Area and Additions	187,410
9: Escudilla Demonstration Area	10,872
10: Research Natural Area	0
11: Water	0
12: Bear Wallow Wilderness	11,080
13: Escudilla Wilderness	5,200
14: Black River	7,176
15: West Fork Black River	3,465
16: Chevelon Canyon	0
17: East and West Forks Little Colorado River	2,360
18: Sandrock	0
Total Acres Suitable for Livestock Grazing = 1,931,951	

Table 191. Acres suitable for livestock grazing by action alternative

	Alternative B	Alternative C	Alternative D
Total Acres of NFS Land	2,015,352		
Acres of NFS Land in the Black River Conservation Area	-28,430		
Acres of NFS Land outside grazing allotments	-77,270		
Acres of NFS Land in Research Natural Area and Recommended Research Natural Area Management Area	-8,140	-8,140	-6,536
Total Acres Suitable for Livestock Grazing	1,901,512	1,901,512	1,903,116

References

- U.S. Forest Service. (1983). Analysis of the Management Situation. Southwestern Region. Apache-Sitgreaves National Forests.
- U.S. Forest Service. (1987). Environmental Impact Statement for the Apache-Sitgreaves National Forests Plan. Southwestern Region. Apache-Sitgreaves National Forests.

Species Viability Analysis Process

The process of analyzing all the forest planning species (FPS), potential natural vegetation types (PNVTs), habitat elements, and four plan alternatives is complex. It therefore relies heavily on an approach that categorizes species, habitats, and management and compares plan alternatives. The viability process involved a series of steps for analyzing the 95 non-fish FPS, consisting of 30 mammals, 22 birds, 6 amphibians/reptiles, 12 invertebrates, and 25 plants. The same process was followed, but in a more generalized manner, for the remaining fourteen FPS, consisting solely of fish species. A description of the species viability analysis process follows.

Step 1: Characterize Species

The first part of the process characterizes the existing condition of FPS relative to their current abundance and distribution. Species most subject to risk for viability are generally those that are rare or uncommon or those whose habitat is most likely to be substantially affected by forest management and activities.

FPS were evaluated using information from earlier wildlife assessment reports which reflected input from Apache-Sitgreaves NFs and other biologists, species specialists, a collaborative wildlife group, knowledgeable publics, and Arizona Game and Fish Department. Each FPS was given a forest or F ranking described in table 192.

Table 192. Forest (F) rankings for forest planning species (FPS) on the Apache-Sitgreaves NFs

F Ranking	Description of species abundance and distribution relative to reference or desired habitat conditions
F? ^a	Unknown abundance and distribution
F1	Extremely rare
F2	Rare
F3	Uncommon (including locally common but in rare locations)
F4 ^b	Widespread
F5	Secure

^a Because of insufficient information to determine abundance and distribution, F? species are analyzed as F1 species.

^b Populations of some F4 species could be affected by extensive landscape scale management and activities depending on timing, both spatial and temporal.

Some of the rarer or uncommon species are designated threatened, endangered, or sensitive species. In addition, some of the FPS are noted as being “highly interactive” species. These are species that play an important ecological role by impacting their habitat or populations of other species, and/or species needing large landscapes and habitat connectivity.

Step 2: Characterize Habitat

The second part of the viability process entails identifying important habitat that is most likely to influence viability. Habitat can be the broad vegetation type or certain habitat features. For the wildlife (non-fish) viability analysis, habitat is characterized by the PNVTs and specific “habitat elements” (e.g., snags, dense cover, down woody debris).

Next, future habitat abundance and future habitat distribution are determined for each PNVT and habitat element based on plan implementation. An underlying assumption is that habitat abundance and distribution within the range of conditions that species have experienced over evolutionary time is likely to maintain them into the future (Haufler, 1999)¹. As such, the historic or reference condition is the desired condition for habitat in order to sustain FPS viability into the future².

Future habitat abundance is qualitatively classified as rare, occasional, or common, Future habitat distribution is qualitatively classified as poor, fair, or good. Table 193 and table 194 provide a description of these classifications. Note that future habitat distribution is classified in terms of desired conditions; hence, while a PNVT or habitat element’s abundance may be common across

¹ Note that the scale of abundance and distribution differs among species (Holthausen, 2002) and was so considered for this analysis.

² Historic, called reference, condition for PNVTs was provided by The Nature Conservancy. Desired conditions are essentially the same as reference conditions for most PNVTs; however, the desired conditions for three PNVTs were adjusted based on three FPS’ needs (see the “Vegetation Specialist Report” (Forest Service, 2014b) for more information). Historic conditions for habitat elements are less well understood but are generally described in other plan desired conditions.

the planning area in the future, if it is still mostly departed from desired conditions based on VDDT modeling states (ESSA Technologies, 2006), it would be considered “poorly” distributed. See the Vegetation Specialist Report (Forest Service, 2014b) for more information.

Table 193. Values used to classify future habitat abundance

Future Habitat Abundance Value	Description
rare	The habitat (PNVT or habitat element) is rare, with limited occurrences, or habitat consists of patches generally occurring over a very minor portion of the planning area.
occasional	The habitat (PNVT or habitat element) is encountered occasionally, generally occurring over a small portion of the planning area.
common	The habitat (PNVT or habitat element) is abundant and frequently encountered, generally occurring over much of the planning area.

Table 194. Values used to classify future habitat distribution

Future Habitat Distribution Value	Description
poor	The habitat (PNVT or habitat element) is poorly distributed within the planning area relative to historic or desired conditions. Number and size of habitat patches and/or their evenness in distribution over the landscape is greatly reduced.
fair	The habitat (PNVT or habitat element) is fairly well distributed within the planning area relative to historic or desired conditions. Number and size of habitat patches and/or their evenness in distribution over the landscape is somewhat reduced.
good	The habitat (PNVT or habitat element) is well distributed within the planning area relative to historic or desired conditions. Number and size of habitat patches and/or their evenness in distribution over the landscape is similar to those conditions.

Combined into table 195, the above classes express the likelihood that a particular PNVT or habitat element would affect viability of the associated species FPS with plan implementation. This is referred to as the likelihood of limitation. Table 196 defines the categories of likelihood of limitation to viability used to compare plan alternatives.

Table 195. Likelihood of limitation to FPS viability based on future habitat abundance and future habitat distribution

Future Habitat Abundance	Future	Habitat	Distribution
	Poor	Fair	Good
rare	High limitation	High limitation	Moderate limitation
occasional	High limitation	Moderate limitation	Low limitation
common	Moderate limitation	Low limitation	Low limitation

Table 196. Definitions for likelihood of limitation to viability based on future habitat abundance and distribution

Likelihood of Limitation	Description
High limitation	High probability that the habitat (PNVT or habitat element) will be limiting for a species' viability
Moderate limitation	The habitat (PNVT or habitat element) has a likelihood of some limitation for a species' viability
Low limitation	The habitat (PNVT or habitat element) will likely not be limiting to a species' viability

Step 3: Characterize the Species-Habitat Relationship

The third part of the process characterizes the relationship between species and associated habitat in order to make comparisons between alternatives. The viability risk rating (VRR) value is created by combining F rankings for individual FPS with the likelihood of limitation for its associated PNVT(s) and habitat element(s). This linkage of species ranking and habitat elements is referred to as the species-habitat relationship.

Table 197. Viability risk rating (VRR) values reflecting species' F rank and likelihood of limitation

Likelihood of Habitat Limitation	F? or F1	F2	F3	F4/F5 ^a
high	very-high	high	moderately-high	moderate/low ^b
moderate	high	moderately-high	Moderate ^b	low/low ^b
low	moderately-high	Moderate ^b	Low ^b	low/low ^b

^a F4 and F5 species are not species of viability concern but a few are considered FPS as highly interactive species.

^b Moderate and low level risk ratings are not considered viability risk ratings of consequence, see the assumptions.

Step 4: Characterize Management Effects

All alternatives include actions to restore or maintain habitat and species viability, but their relative effectiveness varies. Hence, the fourth part of the process characterizes management by alternative in an overall general manner. The management effect (ME) value describes the alternative's relative consequence to each PNVT or habitat element in terms of minimizing risk and contributing to associated species viability as shown in the following table.

Table 198. Description of relative management effect (ME) rating for alternatives

Rating	Management Effect
1	Greatest relative improvement or maintenance of habitat abundance and distribution through management and activities.
2	Intermediate relative improvement or maintenance of habitat abundance and distribution through management and activities.
3	Least to no relative improvement or maintenance of habitat abundance and distribution as a result of management/activities or lack of thereof (or by factors outside of Forest Service control).

Step 5: Viability Consequences

The viability risk rating outcomes and the management effect rating outcomes form the basis for the determination of environmental consequences to FPS as a result of plan implementation. These consequences are expressed as the relative “viability effectiveness” for each alternative for the 15-year planning period, with consideration of trend to 50 years.

This step entails summarizing likelihood of limitation and management effect for each PNVT and habitat element by alternative (figure 85, box 1). The viability risk ratings for each species-habitat relationship by alternative is also summarized (figure 85, box 2).

Next, the number of species-habitat risk ratings of consequence (moderately-high, high, very-high) is tallied for both PVNTs and habitat elements by alternative (figure 85, box 3). The number of viability risk ratings is summarized by alternative for each of the management effects (figure 85, box 4). The viability analysis uses the information generated in the above steps to show how effectively plan implementation would contribute to species viability by alternative.

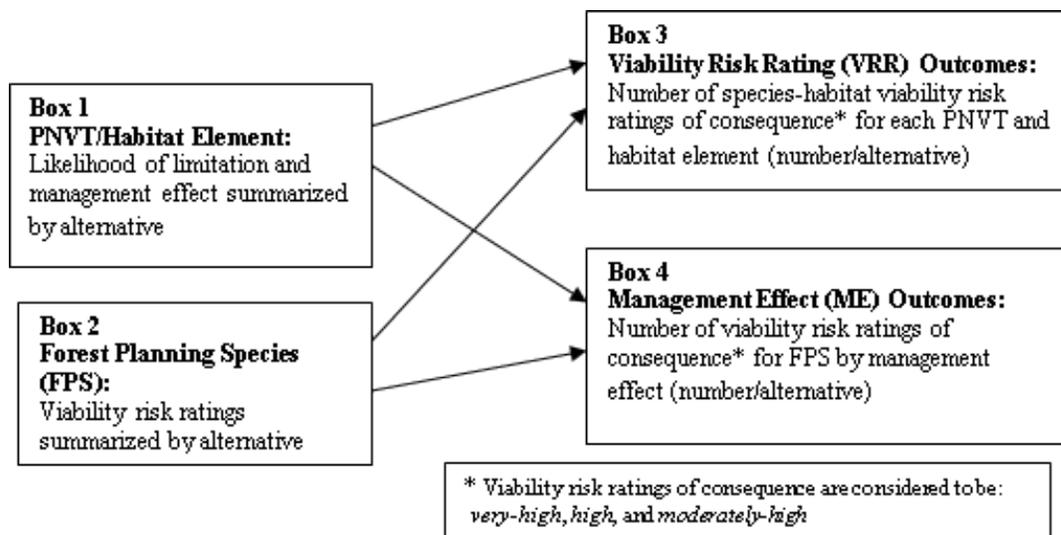


Figure 85. Viability Risk Rating outcomes and Management Effect outcomes that form the basis for environmental consequences

Information used in the species viability analysis as described above include forest plan decisions such as desired conditions, standards and guidelines, different alternative management area allocations, different alternative treatment objectives, and different alternative vegetation states provided by the VDDT modeling (ESSA Technologies, 2006).

Results

The viability risk rating outcomes and the management effect rating outcomes form the basis for the determination of environmental consequences to FPS, expressed as the relative “viability effectiveness” for each alternative. These species viability results are presented in chapter 3 (“Wildlife and Rare Plants” and “Fisheries” sections) of this FEIS. Complete details of the species viability analysis can be found in the wildlife and fisheries specialist reports (Forest Service, 2014c and 2014a) available in the “Plan Set of Documents.”

References

- ESSA Technologies Ltd. (2006). [online] URL: <http://essa.com/>
- Haufler, J.B. (1999). Strategies for conserving terrestrial biological diversity. Pages 17–34 in R.K. Baydack, H. Campa III and J.B. Haufler (eds.). Practical approaches to the conservation of biological diversity. Island Press, Covelo, CA.
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- U.S. Forest Service. (2014c). Wildlife Specialist Report - Viability. Springerville, AZ.

Socioeconomic Resources Analysis

Section 219.12(h) of the 1982 Planning Rule directs the planning team to

[E]valuate the significant physical, biological, economic, and social effects of each management alternative that is considered in detail. The evaluation shall include a comparative analysis of the aggregate effects of the management alternatives and shall compare present net value, social and economic impacts, outputs of goods and services, and overall protection and enhancement of environmental resources.” The economic analysis helps to fulfill these evaluation requirements.

Data Sources

Economic impacts were modeled using IMPLAN Professional Version 3.0 (Impact analysis for PLANning, Minnesota IMPLAN Group, Inc.) with 2009 data. IMPLAN is an input-output model, which estimates the economic impacts of projects, programs, policies, and economic changes on a region. IMPLAN analyzes the direct, indirect, and induced economic impacts. Direct economic impacts are generated by the activity itself, such as the value of cattle grazed on the Apache-Sitgreaves NFs. Indirect employment and labor income contributions occur when a sector purchases supplies and services from other industries in order to produce their product. Induced contributions are the employment and labor income generated as a result of spending new household income generated by direct and indirect employment. The employment estimated is defined as any part-time, seasonal, or full-time job. In the economic impact tables, direct, indirect, and induced contributions are included in the estimated impacts. The IMPLAN database describes the economy in 440 sectors using Federal data from 2009.

Data on use levels under each alternative were collected from the Apache-Sitgreaves NFs' resource specialists. In most instances, the precise change is unknown. Therefore, the changes are based on the professional expertise of the forests' resource specialists (provisions of the 1982 Planning Rule, 219.12(g)).

Regional economic impacts of the alternatives are estimated based on the assumption of full implementation of each alternative. The actual changes in the economy would depend on individuals taking advantage of the resource-related opportunities that would be supported by each alternative. If market conditions or trends in resource use were not conducive to developing some opportunities, the economic impact would be different than estimated here.

Financial efficiency analysis was conducted with QuickSilver Version 6. The financial efficiency analysis compares the anticipated Forest Service expenditures and revenues, by alternative over the life of the plan. Data on program revenues and program expenditures were provided by the Apache-Sitgreaves NFs budget staff and resource specialists (provisions of the 1982 Planning Rule, 219.12(e)). A 4 percent discount rate is commonly used for evaluations of long-term investments and operation in land and resource management by the Forest Service (Forest Service Manual 1971.21). This discount rate was used in the calculation of present net value (PNV). PNV is the difference between program revenues (benefits) and program expenditures (costs) over a 15-year period, using a 4 percent discount rate. The annual expenditures were summed over 15 years using a 4 percent discount rate (so that one dollar today is valued higher than one dollar in 10 years). The sum of the discounted annual expenditures represents the present value of costs. The same exercise was conducted using the annual program revenues for key resource areas. The sum of the discounted annual revenues represents the present value of benefits. The difference between the present value of costs and the present value of benefits is PNV. The higher the PNV, the more financially efficient the alternative. Inflation can affect PNV; however, due to the uncertainty of future inflation, OMB Circular A-94 recommends avoiding assumptions about the inflation rate whenever possible. Thus for the purposes of this analysis, inflation is left at zero.

Social impacts use the baseline social conditions presented in the socioeconomic resources affected environment section of the FEIS and visitor profiles from the NVUM results for the Apache-Sitgreaves NFs (Forest Service, 2001) to discern the primary values that the forests provide to area residents and visitors. Social effects are based on the interaction of the identified values with estimated changes to resource availability and uses.

Assumptions

- Information on the timing of costs and benefits was not available for the economic efficiency analysis. Furthermore, the analysis does not provide a full accounting of all costs and benefits. The only benefits considered are program revenues (i.e., forest receipts) and the only costs considered are direct forest expenditures. Therefore, the estimates of net present value are limited to the available data, which was sufficient to conduct a thorough economic efficiency analysis.
- The economic impact of grazing was estimated using authorized levels. However, actual use is permitted annually based on various factors, such as current forage conditions. Therefore, the estimated economic impact of grazing is likely to overstate the jobs and income provided.
- Changes in use levels were estimated using professional judgment. However, actual changes in use are difficult to predict and frequently depend on factors outside the control of the Forest Service.
- The framework for the social analysis employs generalities. Area residents and Apache-Sitgreaves NFs forest visitors have diverse preferences and values that may not be fully captured in the description of social consequences. Nevertheless, the general categories are useful for assessing social impacts based on particular forest-related interests.

References

- U.S. Forest Service. (2001). National Visitor Use Monitoring Program (NVUM). Accessed March 21, 2011. http://fsweb.nris.fs.fed.us/products/NVUM_Results/index.shtml
- U.S. Forest Service. (2009). Apache-Sitgreaves National Forests Economic and Social Sustainability Assessment. Springerville, AZ.

Research Needs

As a result of extensive environmental analysis related to plan revision, several research needs have been identified related to the resource topics under review. Future data and information provided by research in these areas would help better manage the Apache-Sitgreaves NFs.

- **Aspen**
 - How can the distinction between elk and livestock impacts be made?
 - How can the age of aspen clonal root systems be determined?
 - What is the best indicator of a healthy aspen stand? Is it an even-aged or multi-storied stand?
- **Recreation Use**
 - Are there other monitoring systems, besides the National Visitor Use Monitoring program, that can provide more accurate and timely visitor use information?
- **Grazing**
 - At the project level, how can range readiness be determined based on growing degree days?

- **Species Habitat**
 - What is a reasonable allocation of forage between livestock and wildlife across all ownerships?
- **Wildlife Quiet Areas**
 - What is the effectiveness of wildlife quiet areas?
 - What are the effects of nonmotorized activities, human presence, and level of noise on wildlife?
- **Minor species (sensitive species)**
 - What are the locations, abundance, genetic exchange, and condition of species where this knowledge is lacking?
- **White pine blister rust resistance**
 - What is the genetic diversity of white pine across the forests to counter the impact of white pine blister rust?
- **Priority watersheds**
 - What indicators should be monitored to show actual improvement of watershed condition?
- **Fire**
 - Are planned and unplanned ignitions (wildland fire) an effective tool for moving toward desired conditions?
- **Research Natural Areas (RNA)**
 - What potential research can the recommended RNAs facilitate?

Appendix C. Coordination with Other Public Planning Efforts

Overview

Per the provisions of the 1982 planning regulations, the responsible official shall review the planning and land use policies of other Federal agencies, State and local governments, and American Indian tribes. In addition, the Chief of the Forest Service, Tom Tidwell, has called for an “all-lands approach” to accomplish ecosystem restoration. This involves landowners and stakeholders working together across boundaries to decide on common goals for the landscapes they share. In order to facilitate this all-lands approach, it is important to understand the goals and anticipated activities of landowners adjacent to the national forest. The following sections provide a summary of those goals and activities. Table 199 lists the other public planning efforts that were considered in the plan revision process.

Table 199. Other Federal agencies, State and local governments, and American Indian tribes planning efforts considered in the plan revision process

Eastern Arizona Counties Organization Apache County, Arizona	Show Low, Arizona	Arizona Department of Agriculture
Coconino County, Arizona	Pinetop-Lakeside, Arizona	Arizona Department of Transportation
Greenlee County, Arizona	Greer, Arizona	Arizona Game and Fish Department
Navajo County, Arizona	Springerville, Arizona	Arizona State Forestry Division
Catron County, New Mexico	Eagar, Arizona	Arizona State Land Department
Graham County, Arizona	Nutrioso, Arizona	Arizona State Parks
Gila County, Arizona	Alpine, Arizona	Governor’s Forest Health Council
Grant County, New Mexico	Blue, Arizona	Bureau of Land Management
Heber-Overgaard, Arizona	Eagle Creek, Arizona	Federal Highway Administration
Forest Lakes, Arizona	White Mountain Apache Tribe ^a	Coconino National Forest
Clay Springs, Arizona	San Carlos Apache Tribe	Tonto National Forest
Pinedale, Arizona	Arizona Department of Environmental Quality	Gila National Forest
Linden, Arizona	Arizona Department of Water Resources	U.S. Fish and Wildlife Service

^a The Apache-Sitgreaves National Forests Other Lands and Land Use Plans (Forest Service, 2011e) only reviewed American Indian tribes that have reservations that border the Apache-Sitgreaves NFs. Other tribes that affect forest management are described in the FEIS.

Counties

The Apache-Sitgreaves NFs lie in five counties: Apache, Coconino, Greenlee, and Navajo Counties in Arizona and Catron County in New Mexico. The Apache National Forest portion in New Mexico is administered by the Gila National Forest. The forest borders three other counties: Graham and Gila Counties in Arizona and Grant County in New Mexico.

County comprehensive plans can be used as a source of information on the history of land use within the region, the patterns of development, desired conditions, and current county land use policies. County governments hold no legal authority over independent jurisdictions such as Federal and state lands, incorporated cities and towns or American Indian tribal reservations.

County land use within the planning area ranges from traditional uses such as farming and ranching in rural areas to denser concentrations of residential, industrial, and commercial uses in and around more urban areas (e.g., Show Low, Pinetop-Lakeside, Springerville, Eagar, Heber-Overgaard). One of the common themes is how, and whether, private owners and public land managers can manage the competing priorities of resource conservation and economic development – in particular how to cope with the growing demands for housing and recreation while ensuring preservation of a shrinking natural resource base that contributes to Arizona’s highly valued “rural character.”

Apache County

The comprehensive county plan’s (2004) vision statement includes “Apache County offers a rural character of natural beauty and abundance. This includes values such as independence, privacy, and personal freedom that attract many seeking both permanent residence and seasonal refuge.”

Only 13 percent of the county is privately owned, more than 65 percent is covered by American Indian reservations, and 21 percent is in public ownership. There are three incorporated communities in the county, two of which border the Apache-Sitgreaves NFs: Springerville and Eagar. County lands adjacent to the Apache-Sitgreaves NFs are classified as range land, community village, and rural edge.

The county plan recognizes the National Forest System land exchange process as a growth management tool to help facilitate development of new communities and discourage development in remote or sensitive areas. There is one goal with direct ties to the national forest:

- Goal 9: Reduce the danger from fire for all residents living in a wildland-urban interface or near a national forest boundary.

Greenlee County, Arizona

The vision for Greenlee County from the comprehensive county plan (2003) includes the rural character, outdoor recreation, access, and natural resource harvesting and extracting. Forest Service land makes up 64 percent of the county. Only 6 percent of the county is privately owned. The county has two incorporated towns – Clifton and Duncan. The county goals directly tied to the national forest include the following:

- Connect the forest trails with new trails.
- Return to the multi-use of the land.

- Consider local concerns and implement appropriate actions.
- Maintain a healthy sustainable forest that provides raw materials while limiting incompatible uses.
- Develop roads in the forest for people that cannot hike or use horses.

Navajo County, Arizona

The comprehensive county plan (2004) “character areas” describe the vision for the county by helping to protect the existing community character while maximizing balanced economic development. The lands adjacent to the Apache-Sitgreaves NFs are characterized as community village, rural edge, and rural ranch.

Almost 66 percent of Navajo County is American Indian reservation land. The Forest Service and BLM lands make up 9 percent of the county. The county has six incorporated cities/towns: Holbrook, Pinetop-Lakeside, Show Low, Snowflake, Taylor, and Winslow.

The Rodeo-Chediski Fire prompted a focus on long-term forest health as critical to future growth and development of the county. In particular, the plan focuses on population centers, paved roads, and previously treated forest areas as central to managing similar fires in the future. The plan recommends strategically located treatment programs in areas where multiple canyons converge or where canyons allow fires from below the Mogollon Rim to reach and gain strength at higher elevations. It also recommends that the Mogollon Rim Road and State Route 260 be paved to provide broader firebreaks. It also recommends treatment of a defensible area one mile outside each populated area. The plan advocates a forestwide management plan and professional treatment program that would eliminate excess fuels while providing forest-related jobs for the local economy.

Coconino County, Arizona

The comprehensive county plan’s (2003) vision for Coconino County is based on a conservation framework and emphasizes healthy landscapes where natural resources are conserved and land is used efficiently.

Forest Service land makes up 28 percent of the county, most of the land lies within the Coconino and Kaibab National Forests and the rest lies within the Apache-Sitgreaves and Prescott National Forests. Incorporated cities/towns include Flagstaff, Fredonia, Page, Sedona, and Williams.

The county goals tied to the national forest include the following:

- Improve forest health and promote the restoration of forest ecosystems.
- Manage recreational uses in a manner that minimizes impacts to communities and the environment.
- Concentrate development in designated growth areas while preserving open space and landscapes.

Catron County, New Mexico

Catron County borders the Apache National Forest along its eastern border. The primary land owner along the forest boundary is the Gila National Forest, although there are also several non-Federal parcels.

The primary purpose of the plan for Catron County (1992) is to protect the custom, culture, and livelihoods of county residents in the face of onerous state and Federal regulations. The plan states that county citizens are particularly vulnerable to “aggressive” state and Federal land use policies given the fact most of the county is managed under other jurisdictions. Government land agencies (primarily BLM and Forest Service) have jurisdiction on over 70 percent of lands in Catron County. Reserve is the only incorporated town in Catron County.

In response to a perceived abuse of Federal authority on county lands, the plan explains,

[A]ll natural resource decisions affecting Catron County shall be guided by the principles of protecting private property rights, protecting local custom and culture, maintaining traditional economic structures through self-determination, and opening new economic opportunities through reliance on free markets.

The plan describes Federal and state land use restrictions as arbitrary barriers that have been “illegally imposed” without county government input. This sentiment is found throughout the plan and emphasizes close coordination on the development of Federal and state land use policies that are responsive to the public interest.

The Catron County plan describes both the custom and culture of the county as being linked to traditional land use practices such as livestock grazing, timber harvesting, mining, and hunting. A primary basis for the plan is the stated notion that Federal regulations aimed at protecting the environment and endangered species have had a particularly detrimental effect on the economy and social stability of Catron County.

The plan does not specifically address topics such as preferred locations and densities for residential, commercial, and industrial land uses, nor does it provide guidelines or standards pertaining to community infrastructure or services. The Catron County plan is currently being revised.

Graham County, Arizona

Graham County borders the west side of the Apache National Forest. The San Carlos Indian Reservation occupies the county adjacent to the forests. See the “San Carlos Apache Tribe” section for more info.

Gila County, Arizona

Gila County borders the far southwest portion of the Sitgreaves National Forest along the Mogollon Rim. The county lands adjacent to the Apache-Sitgreaves NFs are not zoned, platted, developed, or are in extremely remote or difficult-to-access locations. The goal for these areas is to maintain a rural, very low density, large lot residential development (LVA Urban Design Studio, 2003).

The “Southern Gila County Community Wildfire Protection Plan” (Logan Simpson Design, Inc., 2010) does not identify wildland-urban interface directly adjacent to the Apache-Sitgreaves NFs. There are several wildland-urban interface areas located within 20 miles and southwest of the forests.

Grant County, New Mexico

Grant County borders the far southeast portion of the Apache National Forest along the New Mexico border. The primary landowner along the boundary is the Gila National Forest, although there are also several non-Federal parcels. The county currently does not have a comprehensive land use plan.

Eastern Arizona Counties Organization

The Eastern Arizona Counties Organization (ECO) is a local government organization created in 1993 to review Federal programs which affect the custom, culture, and economic well-being of the counties. ECO represents five counties: Apache, Gila, Graham, Greenlee, and Navajo.

ECO has identified seven objectives for the counties that relate to the Apache-Sitgreaves NFs land management plan:

1. Rangelands Resources Management
2. Forest Products Resources Management
3. Mineral and Energy Resources Management
4. Motorized Travel and Recreation Management
5. Forested Ecosystems Restoration and Catastrophic Wildfire Prevention
6. Watersheds Restoration
7. Management Areas Designation

Community Wildfire Protection Plans (CWPPs)

Three community wildfire protection plans (CWPP) outline goals for at-risk-communities within and around the Apache-Sitgreaves NFs:

- “Community Wildfire Protection Plan for At-Risk Communities of the Apache National Forest in Apache County” (Logan Simpson Design, Inc., 2004a)
- “Community Wildfire Protection Plan for At-Risk Communities of the Sitgreaves National Forest in Apache, Coconino, and Navajo Counties” (Logan Simpson Design, Inc., 2004b)
- “Greenlee County Community Wildfire Protection Plan for At-Risk Communities of the Apache National Forest in Greenlee County” (Logan Simpson Design, Inc., 2005)

The primary goal of the plans is for Federal land to return to Condition Class I where wildland fire can be incorporated into long-term management practices to sustain forest health. The plans

also delineate the wildland-urban interface where human development meets and intermingles with undeveloped wildland or vegetative fuels. The plans are used by Apache-Sitgreaves NFs' managers to help prioritize areas for fuel reduction treatments.

Communities, Towns, and Cities

There are several communities, towns, and cities within or adjacent to the Apache-Sitgreaves NFs. These include Heber-Overgaard, Forest Lakes, Clay Springs, Pinedale, Linden, Show Low, Pinetop-Lakeside, Greer, Springerville, Eagar, Nutrioso, Alpine, Blue, and Eagle Creek.

The communities surrounding the Apache-Sitgreaves NFs have a history of involvement with and dependence upon the national forests and natural resources in general. Arizona has long been dependent upon natural resources for commodity production, clean water, tourism, and aesthetic enjoyment. As a result the public has frequently expressed interest in the use and management of these resources. Some recent examples include the following:

- Town of Pinetop-Lakeside – In 2008, the town inquired about a special designation for Woodland Lake Park. The park is under permit to the town and is within city limits; however, it is located on NFS land.
- City of Show Low – In 2009, the city adopted a resolution supporting the Four-Forest Restoration Initiative, a strategy to implement landscape-scale restoration of the region's forests, and authorizing the signing of a letter of support urging Congress to provide the necessary resources to implement it.
- Town of Eagar – In 2010, the town council adopted a resolution requesting the Apache-Sitgreaves NF maintain the existing management practice (allowing cross-country travel) and the accessibility of all existing roadways and trails as they currently are within the forests.

One of the most common concerns of these communities is the risk associated with uncharacteristic wildfire and hazardous fuel buildup. This issue has been articulated in the community wildfire protection plans (see above).

Tribes

Federally recognized American Indian tribes occupy about 53.5 million acres (7 percent) of land in the western states. Two reservations border the west side of the Apache-Sitgreaves NFs: Fort Apache Indian Reservation and San Carlos Apache Reservation. These tribes are legally considered to be sovereign nations, meaning the Forest Service has a government-to-government relationship with the tribes. Tribes that enter into contracts with the Federal government do so just as state governments or sovereign nations do.

In addition, the Federal government also holds a special responsibility to consult with tribes about management concerns that may affect them. This process is governed by a variety of Federal regulations and policies, including the Forest Service Handbook 1509.13, the National Environmental Policy Act, the National Indian Forest Resources Management Act, the Tribal Forest Protection Act, the Archeological Resources Protection Act, and several presidential executive orders.

Tribes' use of Forest Service land includes free, non-permitted activities such as gathering boughs and basket materials as well as the use of products such as sawtimber. In addition, the Apache-Sitgreaves NFs include traditional cultural places, the locations of which are known only to the tribes.

Fort Apache Indian Reservation (White Mountain Apache Tribe) Forest Management

The 2005-2014 Forest Management Plan (Fort Apache Agency, 2005) identifies several reservation-wide forest management objectives. They include the following:

- Utilize a variety of silvicultural tools including commercial harvesting, precommercial thinning, prescribed fire, site preparation, and natural and artificial regeneration to move stand structure, composition, and other characteristics toward that of the target forest.
- To the extent possible, practice uneven-aged management within ponderosa pine and mixed conifer stands. Even-aged methods are silviculturally appropriate for spruce and aspen stands, fire damaged areas, or areas with severe insect or disease infestations.
- Maintain forest qualities that will protect or provide wildlife habitat, recreational opportunities, good forage, quality scenery, clean rivers and streams, and other multiple-use values.
- Improve wildlife habitat by increasing production of forage and browse and diversity in species, density, and cover.
- Enhance opportunities for livestock production by increasing abundance and vigor of palatable forage, through density management of overstory trees. Work with range conservationists to coordinate any grazing deferments or systematic grazing schedules that benefit the resource as a whole.
- Protect soil and water quality by developing prescriptions that will enhance watershed condition through time.
- Conduct harvest operations to obtain as complete utilization of forest products as practical. Assist the White Mountain Apache Tribe in developing markets for previously under-utilized forest products or species.
- Minimize threat to life and property, and damage to forests, soils and watersheds from catastrophic wildfire through effective fire prevention, enforcement, pre-suppression, and suppression programs.
- Provide sufficient initial attack forces to confine fires as soon as possible. For fires which escape, or are expected to escape initial attack, systematically build up suppression and support forces to the level required to bring about control in a safe, effective, and efficient manner.
- Manage natural and activity-created wildland fuels to reduce wildfire size, intensity, behavior, and threat to life and property.

The forest management plan divides the reservation into twelve management emphasis areas (MEAs) including wilderness, sensitive fish, sensitive plants, water, sensitive wildlife, recreation, sensitive sites, scenic byways, community, fuels management, limited management, and forest products.

Recreation and Wildlife

Recreation is managed with a permit system for fishing, hunting, camping, hiking, river rafting, sightseeing, picnicking, biking, and cross-country skiing. The tribe offers a trophy elk hunting program that has been in operation since 1976 (White Mountain Apache Tribe, 2010).

Transportation

There are approximately 1,000 miles of roadways on the Fort Apache Indian Reservation. There are also about 128 miles of State highways, including State Route 73 in the northern part of the reservation which passes through the communities of Fort Apache and White Mountain. U.S. Highway 60/State Route 77 runs from the Salt River Canyon and the border with the San Carlos Indian Reservation to the intersection with State Route 260, north of the reservation border. State Route 260 is an east-west route in the northeast corner of the reservation that goes through Hon-Dah and McNary. The BIA agency roads engineer works closely with the tribe on transportation. The BIA has staff on the reservation and is responsible for the roads' programming and maintenance. The BIA has a consulting contract to develop the long-range transportation plan for the tribe. As of 2004, ongoing and proposed road projects included the reconstruction of BIA Road 690, the construction of dirt and gravel roads in residential areas of McNary, the stabilization, and resurfacing of an 8-mile stretch of BIA Road 69, and a cooperative project with ADOT to improve the intersection of State Road 73 and State Road 260 (FHWA, 2004).

San Carlos Apache Tribe (Nde Nation)

Forest Management

The Tribe has a forest resources program, including timber sales, thinning, wood cutting, and fire activities (San Carlos, 2011).

Recreation and Wildlife

A recreation permit is required for non-tribal members and allows entry on the Reservation for any recreational activities (e.g., hiking, picnicking, touring, camping), other than hunting or fishing. Wildlife resources include Rocky Mountain elk, Coues whitetail deer, Rocky Mountain bighorn sheep, desert bighorn sheep, javelina, pronghorn antelope, black bear, mountain lion, wild turkey, predators, and other small game. The Drylake and Hilltop trophy elk units are managed for older age structure and have produced some of the largest elk in the world (San Carlos, 2010).

Transportation

The San Carlos Apache Tribe does not receive the same Federal Highway Administration (FHA) transportation planning support as the White Mountain Apache Tribe; however, information on transportation concerns on the San Carlos Apache Reservation can be requested through the Inter Tribal Council of Arizona's Transportation Working Group.

State of Arizona

The Apache-Sitgreaves NFs is located in the State of Arizona. State regulatory agencies, as well as adjacent State-owned lands, affect the management of the national forests.

Arizona Department of Environmental Quality

The Arizona Department of Environmental Quality's mission is to protect and enhance public health, welfare, and the environment in Arizona. The agency serves as the State's environmental regulatory agency in the areas of air and water quality and waste programs. Forest management activities strive to be in compliance with the applicable Arizona Revised Statutes (particularly Title 49 which outlines specifics such as water quality standards and total maximum daily loads).

Arizona Department of Water Resources

The Arizona Department of Water Resources (ADWR) mission is to secure long-term dependable water supplies for Arizona (ADWR, 2011). The ADWR administers and enforces the State's groundwater code and surface water rights laws. Title 45 of the Arizona revised statutes contains the provisions related to water and groundwater resources.

Arizona Department of Agriculture

The Arizona Department of Agriculture is the State's regulatory agency for agriculture, including animals, plants, and environmental services (ADA, 2010). Title 3 of the Arizona Revised Statutes contains the provisions related to agricultural topics such as dangerous plant pests and diseases, pesticides, brands and marks, and seizure of livestock.

Arizona Department of Transportation

The Arizona Department of Transportation (ADOT) is responsible for planning, building, and operating a state highway system and maintaining bridges.

Improvement and Construction

The State Transportation Improvement Program (STIP) for Fiscal Years 2010-2013 (ADOT, 2010) was completed in January 2010. The 2011-2015 Five-year Transportation Facilities Construction Program was approved on June 23, 2010. These documents identify planned improvements and construction over the next several fiscal years. The planned improvements to the following highways and forest highways may affect forest management:

- Forest Highway 43-1 Sunrise Park to Big Lake – FY2010 grading, drainage and paving work were initiated; project expected to be complete in FY2013
- State Route 260 Heber to Show Low – FY2011 construct passing lanes
- U.S. Highway 60 Show Low to Little Mormon Lake – FY2014 widen highway
- National Scenic Byways Statewide – FY2011 install signs

Several highway improvement studies are also underway.

Long Range Planning

ADOT's long-range transportation plan for 2010-2035 was completed in November 2011 (ADOT, 2011). It serves as the principal high-level capital programming guide for ADOT and identifies broader statewide transportation investment needs.

Scenic Byways

The Arizona Department of Transportation's Environmental and Enhancement Group prepared the "Coronado Trail Corridor Management Plan" in March 2005. This plan identifies the goals and objectives for the byway corridor.

Arizona Game and Fish Department

The Arizona Game and Fish Department's (AZGFD) Strategic Plan for the Years 2007-2012 Wildlife 2012 (AZGFD, 2007) provides the management direction for the department's program of work. The plan contains several goals and objectives that may have an impact on Apache-Sitgreaves NFs management:

- Wildlife Resource Management – Conserve, preserve, enhance, and restore wildlife populations and their habitats.
- Wildlife Recreation – Increase the opportunity for the public to enjoy Arizona's wildlife resources, while maintaining and improving wildlife resources. In addition, address the underlying reasons for denial of public access across private lands by providing technical and financial assistance to private landowners and educating the public about ethical use and habitat protection.
- Public Awareness, Support and Involvement – Maintain an informed and supportive public that recognizes its ownership and stewardship responsibilities for wildlife resources and helps to disseminate and act upon messages about watercraft safety and the safe, responsible and ethical use of off-highway vehicles.
- Off-highway Vehicle, Watercraft and Shooting Sports Recreation Goals – Increase the opportunity for the public to enjoy shooting sports. Encourage participation in education and information programs supporting safe and responsible use of off-highway vehicles and watercraft, while maintaining or improving wildlife resources and habitats.
- Customer Diversity – Increase customer diversity to better reflect the demographics of Arizona.
- Partnerships – Maintain and develop effective partnerships that enable the Department and its partners to reach mutual goals.

The Arizona State Wildlife Action Plan, titled "Arizona's Comprehensive Wildlife Conservation Strategy: 2005-2015" (AZGFD, 2006) provides the vision for managing Arizona's fish, wildlife, and wildlife habitats over the next 10 years. The plan contains several key elements which may provide information to or have an impact on Apache-Sitgreaves NFs management:

- Species of Greatest Conservation Need – The AZGFD prioritized a list of species for conservation actions aimed at improving conditions for those species through intervention at the population or habitat level. Over 300 species were identified as being vulnerable or the species with the greatest conservation needs.
- Habitats of Greatest Conservation Need – The AZGFD divided the State into 17 vegetation types. All of these habitats were treated as habitat in need of conservation. A statewide habitat analysis that answers the question of where to focus in each habitat has not been completed.
- Stressors/Threats to Arizona's Wildlife and Wildlife Habitats – The AZGFD identified 70 stressors that have serious impacts to habitat in Arizona and an additional 4 stressors

- that act on species alone. The stressors were categorized into a rapidly increasing human population, changes to water storage and delivery systems in the Southwest, alteration of communities by invasive nonnative species, and the ongoing drought and warming trend.
- Conservation Actions for Arizona’s CWCS – The AZGFD identified several action items to address stressors, these action items will be implemented where feasible and appropriate.

Arizona State Forestry Division

The Arizona State Forester oversees the Arizona State Forestry Division (ASFD). The ASFD mission is to manage and reduce wildfire risk to Arizona’s people, communities, and wildland areas and provide forest resource stewardship through strategic implementation of forest health policies and cooperative forestry assistance programs. In 2010, the ASFD released the “Arizona Forest Resource Assessment” (Arizona State Forestry Division, 2010) and “Arizona Forest Resource Strategy” (Arizona State Forestry Division, 2010a).

The strategy identifies major resource issues and their related goals. The Apache-Sitgreaves NFs is a key partner and stakeholder in helping to implement this strategy.

- People and Forests-Goal 1: People and communities receive maximum benefits from forests and trees.
- People and Forests-Goal 2: Minimized human impacts to trees and forests.
- Ecosystem Health-Goal 1: Resilient and diverse ecosystem structures, processes, and functions.
- Ecosystem Health-Goal 2: Progress toward landscape scale outcomes, restoration of unhealthy ecosystems, and enhanced sustainability with limited negative impacts.
- Water-Goal 1: Improved water quality and quantity from forested watershed.
- Water-Goal 2: Improved health and resiliency of forested aquatic systems (riparian areas, springs, and wet meadows.)
- Water-Goal 3: Increased public understanding of the importance of forests to Arizona's water quality.
- Air-Goal 1: Improved air quality.
- Air-Goal 2: Increased public understanding of the importance and effects of fire on Arizona's air quality.
- Fire-Goal 1: Wildland ecosystems where appropriate fire regimes maintain health and resiliency of natural vegetation.
- Fire-Goal 2: “Fire Adapted Communities” that provide shared stakeholder responsibility for healthy landscapes and wildfire prepared communities.
- Fire-Goal 3: Enhanced wildland fire management capacity in Arizona.
- Fire-Goal 4: An Arizona public and government leadership that is well informed about wildland fire management, science, and prevention issues.
- Economics-Goal 1: Realized long-term economic potential of sustainable forest products and bioenergy (while achieving Ecosystem Health goals).
- Economics-Goal 2: Protection of areas with economic development potential related to ecosystem services.

- Economics-Goal 3: Community recognition of the economic importance to protecting healthy natural systems.
- Climate Change-Goal 1: Increased resilience of ecosystems to climate change.
- Climate Change-Goal 2: Reduced rate of future climate change through maximized carbon sequestration in Arizona forests and trees.
- Culture-Goal 1: Improved communication between all land management agencies, indigenous tribes, and other cultural groups about varying perspectives and beliefs related to forests, trees, and other natural resources.
- Culture-Goal 2: Effective collaboration mechanisms for sharing of information about resources, priorities, policies, and management strategies between Tribes and non-Tribal organizations.

Arizona State Land Department

The practice of allocating public lands for various beneficiaries in Arizona dates back to the founding of the territory in 1863. The current system of managing these lands, referred to as State Trust lands, was established with the Arizona State Land Department (AZSLD) in 1915 (AZSLD, 2011a and 2011b).

Since its inception, the AZSLD has been granted authority over all trust lands as well as the natural products they provide. This authority over trust land is central to the AZSLD's primary mission of maximizing revenues for its beneficiaries, a role that distinguishes it from other agencies charged with management of public lands (e.g., national parks, national forests, state parks).

As of 2008, the AZSLD managed over 9 million acres in land holdings for 14 beneficiaries, the most prominent of which is the K-12 public school system. Most of the state lands can be used for livestock grazing purposes only. Public use of the lands is regulated by permit. A recreational permit allows the signatory limited privileges to use State Trust Land for some recreation, namely hiking, horseback riding, picnicking, bicycling, photography, sightseeing, and bird watching. Camping is restricted to no more than 14 days per year. Off-highway vehicle travel on State Trust Land is not permitted without proper licensing.

The AZSLD may dispose of (exchange) or lease the lands for natural resource use or commercial development purposes. Since state lands border much of the national forests, especially the southern portion of the Apache NF and the northern portions of both the Apache NF and Sitgreaves NF, any changes in management could affect the management of the Apache-Sitgreaves NFs. The AZSLD prepares a five-year plan that presents potential areas of concern to initiate land sales and long term leases. As of July 2012, this plan was not available.

Arizona State Parks

The mission of the Arizona State Parks (ASP) is to manage and conserve Arizona's natural, cultural, and recreational resources for the benefit of the people, both in the parks and through their partners (Arizona State Parks, 2010).

ASP manages several parks across Arizona. Four of these parks are near or on the Apache-Sitgreaves NFs; these include Fool Hollow Lake, Lyman Lake, Tonto Natural Bridge, and Roper

Lake. The Fool Hollow Lake Recreation Area, located on the Apache-Sitgreaves NFs, is operated by ASP.

Arizona State Parks have seen a continual increase in visitation over the years, with over 1,000,000 visitors in 1985 to over 2,000,000 visitors in 2010 (Arizona State Parks, 2010). The State and National financial crisis impacted the management of state parks. In FY2010, the ASP reduced the number of employees and closed 13 of its 28 parks (Arizona State Parks, 2010).

The 2008 “Arizona Statewide Comprehensive Outdoor Recreation Plan” (SCORP) identifies the State’s outdoor recreation priorities. The priority issues include secure sustainable funding, plan for growth/secure open space, resolve conflicts, improve collaborative planning and partnerships, respond to the needs of special populations and changing demographics, fill the gaps between supply and demand, secure access to public lands and across State Trust Lands, protect Arizona’s natural and cultural resources, and communicate with and educate the public (Arizona State Parks, 2007). Several action items have the potential to influence NFS lands:

- Look holistically across geographic boundaries, disciplines, governments, private interests, and generations and examine all benefits and costs, not just fiscal costs (in reference to growth).
- Expand options such as private landowner incentive programs and recreational liability laws, which would allow public access across private and State and Federal leased lands,
- Provide for OHV use on public lands but manage it properly, to reduce conflicts with other recreation users and minimize the activity’s impacts on natural and cultural resources, as is done for other recreational activities. Implement standards for constructing sustainable OHV routes, involving user groups in planning, building and maintaining satisfactory routes and facilities, and enacting and enforcing consistent OHV laws and regulations.
- State and Federal agencies should implement coordinated interagency planning efforts for new recreational areas and trail systems to ensure an equitable regional distribution of desired recreational opportunities and access to natural environments.

The SCORP also identifies the major impacts and trends related to outdoor recreation in Arizona. Arizona offers a wide variety of outdoor recreation opportunities with 6 national forests, 21 national park sites, 8 national wildlife refuges, 8 Bureau of Land Management field offices, 21 American Indian tribes, 30 State Parks, 23 State wildlife areas, and hundreds of county and city parks and recreation areas. These public lands provide opportunities for activities such as picnicking, developed and primitive camping, wilderness backpacking, hiking, mountain biking, horseback riding, cross-country skiing, wildlife watching, hunting, fishing, boating, water skiing, rock climbing, four-wheel driving, motorized trail biking, all-terrain vehicle riding, and snowmobiling, among others (Arizona State Parks, 2007).

The Arizona Trails 2010: State Motorized and Nonmotorized Recreation Trails plan provides information and recommendations to guide ASP and other agencies in their management of trails. The priority recommendations for motorized trails are protect access to trails/acquire land for public access; maintain and renovate existing trails and routes; mitigate and restore damage to areas surrounding trails, routes, and areas; and establish and designate motorized trails, routes, and areas. The priority recommendations for nonmotorized trails are maintain existing trails, keep trails in good condition, and protect access to trails/acquire land for public access (Arizona State Parks, 2009).

Governor's Forest Health Council

In 2003, Governor Janet Napolitano formed the Forest Health Advisory Council and the Forest Health Oversight Council in response to the growing number, frequency, and intensity of uncharacteristic wildfires threatening Arizona's resources and communities. In 2007, the councils produced the "Statewide Strategy for Restoring Arizona's Forests" (Governor's Forest Health Council, 2007). The report identifies five key strategies:

1. Increase the human and financial resources dedicated to restoring Arizona's forests and protecting communities.
2. Coordinate and implement action at the landscape scale.
3. Increase the efficiency of restoration, fire management, and community protection activities.
4. Encourage ecologically sustainable, forest-based economic activity.
5. Build public support for accomplishing restoration, community protection, and fire management across the state.

Federal

Other Federal agencies affect the management of the Apache-Sitgreaves NFs, either because they have lands that adjoin the forests (e.g., Bureau of Land Management, other national forests), they manage features that occur on the national forest (e.g., Federal Highway Administration), or they have oversight responsibilities (e.g., U.S. Fish and Wildlife Service).

Bureau of Land Management

The majority of Bureau of Land Management (BLM) land adjacent to the Apache-Sitgreaves NFs occurs on the southern border of the Apache NF and is administered by the Safford Field Office. The 1991 "Safford District Resource Management Plan" (BLM, 1991) provides guidance to the district in the management of its resources. The plan addresses the following issues: access, area of critical environmental concerns and other types of special management areas, off-highway vehicles, riparian areas, wildlife habitat, lands and realty, outdoor recreation and visual resource management, energy and minerals, cultural resources, soil erosion, vegetation, water resources, air quality, and paleontological resources.

The focus of active management includes riparian improvement treatments, wildlife habitat improvement projects (including prescribed fire and suppression), soil erosion reduction, land treatments or vegetation manipulation including mechanical, chemical or prescribed fire, and firewood cutting. The majority of the public lands are managed to limit off-highway vehicle use to existing roads and trails. The 1,708-acre Hot Well Dunes is open to off-highway vehicle use anywhere in the area (Brady, 2011).

The only Area of Critical Environmental Concern (ACEC) or Coordinated Resource Management Plan Area that borders the Apache-Sitgreaves NFs is the 120-acre Coronado Mountain Research Natural Area (RNA) ACEC. This area is managed to exclude rights-of-way, mineral entry and woodcutting; use prescribed fire; and preserve its scenic quality.

Future Activities

A review of the 2011 NEPA Project Log for the Safford Field Office (BLM, 2011) showed that no projects are currently planned. However, personal communication with the district staff highlighted activities that are occurring near Apache-Sitgreaves NFs lands: renewable energy (including windfarm installations north of the forest and potential energy transmission corridors), potential juniper thinning on BLM lands north of the forest, and burning south of the forests.

The district has several ongoing projects (Aravaipa Ecosystem Management Plan, Proposed SunZia Southwest Transmission Line Project, Chiricahua FireScape Project), although they occur in the southeastern part of the State.

Federal Highway Administration

The role of the Federal Highway Administration (FHA) is to ensure that America's roads and highways are safe and technologically up-to-date. Although most highways are owned by State, local, and tribal governments, FHWA provides financial and technical support (FHA, 2011). The Federal Lands Highways funding provides dollars for roads and highways within federally owned lands, such as national forests.

The Central Federal Lands Highway division, of which Arizona is a part, is in the process of developing its long-range transportation plan (FHA, 2010). The planning effort has identified two major trends: (1) Arizona population is increasing primarily in urban areas, and (2) forest visitation and recreation is increasing as a result of population increase. Within Arizona, 12 percent of the paved forest highway network is rated as poor or failed, while 7 percent of the unpaved network is rated as poor or failed and 3 percent of the bridges are in poor condition. Forest Highway 43 improvements, including paving, were completed as of January 2011. These upgrades to the highway have the potential to change visitor use.

Table 200. Forest highways located on the Apache-Sitgreaves NFs

Forest Highway	Owner	Road Type	Condition
FH 41	Federal	Paved	Poor
FH 40	Federal	Unpaved	Good
FH 11 (SR 260)	State	Paved	Good
FH 30	State	Paved	Excellent
FH 43 (SR 273)	State	Paved	Excellent
FH 35 (SR 261)	State	Paved	Fair
FH 20 (U.S. 180)	State	Paved	Good
FH 42	Federal	Unpaved	Good
FH 19 (U.S. 191)	State	Paved	Fair

Forest Service

Three national forests border the Apache-Sitgreaves NFs: the Coconino, Tonto, and Gila National Forests. Each of these forests' management is guided by a land management plan. The Coconino National Forest is currently in the process of revising their plan; the Tonto and Gila National Forests are expected to revise their plans in the near future. As forest management changes are proposed, the forests coordinate and adjust their management strategies as appropriate.

Coconino National Forest

The Coconino National Forest is managed by their forest plan originally developed in August 1987 (Forest Service, 1987). The plan identifies several forestwide goals for 19 topic areas, including (1) outdoor recreation, (2) wilderness, (3) wildlife and fish, (4) riparian, (5) range, (6) noxious and invasive weeds, (7) timber, (8) soil, water and air quality, (9) minerals, (10) lands, (11) transportation and administrative facilities, (12) protection, (13) law enforcement, (14) research natural areas, botanical areas, and geological areas, (15) Elden environmental study area, (16) public affairs, (17) human resources, (18) land management planning, and (19) general administration.

The management areas of the Coconino NF that border the western edge of the Apache-Sitgreaves NFs are the following:

- Management Area 10: Grassland and Sparse Piñon-Juniper Above the Rim – The management emphasis is range management, watershed condition, and wildlife habitat. Other resources are managed to improve outputs and quality. Emphasis is on prescribed burning to achieve management objectives.
- Management Area 7: Piñon-Juniper Woodland, Less than 40 Percent Slope – The management emphasis is firewood production, watershed condition, wildlife habitat, and livestock grazing. Other resources are managed in harmony with the emphasized resources.
- Management Area 6: Unproductive Timber Land – Emphasis is a combination of wildlife habitat, watershed condition, and livestock grazing. Other resources are managed in harmony with the emphasized resources.
- Management Area 3: Ponderosa Pine and Mixed Conifer, Less than 40 Percent Slope – Emphasis is a combination of multiple-uses including a sustained yield of timber and firewood production, wildlife habitat, livestock grazing, high quality water, and dispersed recreation.
- Management Area 19: Mogollon Rim – Emphasis is dispersed and developed recreation, visual quality, and wildlife travel corridors across the Rim, generally the heads of major canyons running to the northeast. Dwarf mistletoe is aggressively treated.

The Coconino NF is currently in the process of revising their forest plan.

Gila National Forest

The Gila National Forest is managed by their forest plan, originally published in September 1986 (Forest Service, 1986). The plan identifies goals in 17 topic areas including (1) range, (2) recreation, (3) wilderness, (4) timber, (5) wildlife and fish habitat, (6) minerals, (7) soil and water, (8) riparian, (9) air quality, (10) fire, (11) law enforcement, (12) lands and special uses,

(13) facilities, (14) cultural resources, (15) land management planning, (16) human resources, and (17) research natural areas.

The management areas of the Gila NF that border the Apache-Sitgreaves NFs from north to south along the New Mexico border are the following:

- Management Area 3D – management emphasis is to provide for a long term increase of about 20 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage suitable timber to provide long-term sustained yield; firewood harvest to provide sustained yield; recreation opportunities range from semi-primitive to roaded natural.
- Management Area 3B – management emphasis is to provide for a long-term increase of about 40 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage suitable timber to provide long-term sustained yield; firewood harvest to provide sustained yield; recreation opportunities range from semi-primitive to roaded natural.
- Management Area 3A – management emphasis is to provide for a long-term increase of about 60 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage wilderness resource to protect and restore natural conditions; manage suitable timber to provide long-term sustained yield; firewood harvest to provide sustained yield; recreation opportunities range from primitive to roaded natural.
- Management Area 4B – management emphasis is to provide for a long-term increase of about 10 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage wilderness resource to protect and restore natural conditions; manage suitable timber to provide long-term sustained yield; firewood harvest to provide sustained yield; recreation opportunities range from primitive to roaded natural.
- Management Area 7 – management emphasis is to provide for a long-term increase of about 30 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage wilderness resource to protect and restore natural conditions; firewood harvest to provide sustained yield; recreation opportunities range from semi-primitive motorized to roaded natural.
- Management Area 4C – management emphasis is to provide for a long-term increase of about 20 percent in herbaceous forage for wildlife; manage woodlands and forests to provide wildlife habitat; manage wilderness resource to protect and restore natural conditions; manage suitable timber to provide long-term sustained yield; firewood harvest to provide sustained yield; recreation opportunities range from semi-primitive to roaded natural.

Tonto National Forest

The Tonto National Forest is currently managed by their forest plan originally developed in October 1985 (Forest Service, 1985). The plan identifies five forestwide goals for the following topics: (1) soil water and air quality, (2) fire management, (3) pest management, (4) wildlife and fish, and (5) transportation and utility corridors.

There is only one Tonto NF management area that lies adjacent to the Apache-Sitgreaves NFs:

- Management Area 4D: Payson Ranger District, Mogollon Rim Area – The management emphasis is to manage for a variety of renewable resource outputs with primary emphasis on intensive, sustained yield timber management, timber resource protection, creation of wildlife habitat diversity, increased populations of harvest species and recreation opportunity. Recreation opportunities range from semi-primitive to urban.

Four-Forest Restoration Initiative

The Four-Forest Restoration Initiative is a collaborative effort to restore forest ecosystems on portions of four national forests—Coconino, Kaibab, Apache-Sitgreaves, and Tonto—primarily along the Mogollon Rim in northern Arizona. Environmental analysis for the proposed action began in 2010 and the contract to begin implementation was awarded in 2012.

The overall goal of the four-forest effort is to create landscape-scale restoration approaches that provides for fuels reduction, forest health, and wildlife and plant diversity. A key objective is doing this while creating sustainable ecosystems in the long term. Businesses play a key role in the effort by harvesting, processing, and selling wood products. This reduces treatment costs and provides restoration-based work opportunities that create jobs.

U.S. Fish and Wildlife Service

The main role of the U.S. Fish and Wildlife Service's (USFWS) is to administer the Endangered Species Act (ESA) (USFWS, 2011). Section 7 (a)(1) of the ESA directs Federal agencies to aid in conservation of listed species and section 7 (a)(2) requires that agencies, through consultation with the USFWS, ensure that their activities are not likely to jeopardize the continued existence of listed species or adversely modify designated critical habitat. As projects and activities are planned, forest managers consult with the USFWS.

The USFWS also issues national policies to promote the conservation and recovery of listed species, including species recovery plans. The USFWS is in the process of developing a strategic plan to react to climate change.

The USFWS manages the National Wildlife Refuge System; there are no refuges near the Apache-Sitgreaves NFs. They occur primarily in the far west and southern portions of Arizona and central New Mexico.

Other Landowners

The Apache-Sitgreaves NFs border and surround other ownerships besides those listed above. There is no known inventory of these landowners' activities and potential impacts to the forests.

Conclusion

As identified above, other landowners and land policies have the potential to impact the Apache-Sitgreaves NFs and vice-versa. In the development of the land management plan, these considerations have been taken into account. Table 201 identifies some of the key potential impacts and how the proposed plan deals with those impacts. Table 202 identifies potential activities on adjacent lands that may impact forest management. Impacts of actions on adjacent

lands are analyzed in the cumulative environmental consequences section of chapter 3 in the FEIS. No major conflicts with Forest Service planning have been identified at this time.

Table 201. Potential impacts to forest management and their relationship to the proposed plan

Potential Impacts/Issues	How the Proposed Plan Addresses
Call for multiple use of the forests	<p>The overall goal of managing National Forest System lands is to sustain the multiple uses of its resources in perpetuity while maintaining the long-term productivity of the land.</p> <p>The proposed plan carries out that goal.</p>
Community growth demand	<p>The proposed plan identifies a management emphasis to work with local communities to understand their community expansion needs and retain access to NFS land.</p>
Danger from wildfire for residents living in a wildland-urban interface	<p>Desired Condition: Human life, property, and natural and cultural resources are protected within and adjacent to NFS lands.</p> <p>Desired Condition: The composition, density, structure, and mosaic of vegetative conditions reduce uncharacteristic wildfire hazard to local communities and forest ecosystems.</p> <p>Desired Condition: Forest visitors have access to information about topics of concern related to the Apache-Sitgreaves NFs (e.g., ecosystem restoration, unmanaged recreation, uncharacteristic wildfire), including appropriate visitor behavior (e.g., follow forest orders, pack out trash, appropriate sanitation, wildfire prevention).</p> <p>The vegetative treatment objectives are prioritized in priority watersheds and areas identified in community wildfire protection plans.</p> <p>The proposed plan contains a “Wildland Fire Management” section that describes the Apache-Sitgreaves NFs’ management intent for wildland fire. The “Landscape Scale Disturbance Events” section provides direction for protecting existing resources and facilitating recovery of soil and vegetation components following a large disturbance.</p>
Improve forest health and promote the restoration of ecosystems	<p>The desired conditions describe a healthy, sustainable forest and the objectives identify actions that would help restore ecosystems. The proposed plan’s management focus is on achieving satisfactory watershed conditions and restoring ecological functions, especially natural fire regimes.</p> <p>Objective: During the planning period, improve the condition class on at least 10 priority 6th level HUC watersheds by removing or mitigating degrading factors.</p>
Maintain a healthy, sustainable forest that provides raw materials	<p>Desired Condition: The Apache-Sitgreaves NFs provide a sustainable supply of forest products (e.g., small roundwood, sawlogs, biomass, firewood, cones, Christmas trees, wildings) to business and individuals within the capability of the land.</p>
Forest-related jobs for the local economy	<p>Timber production and tree cutting continue and contribute to the local and regional economy. Other multiple uses of the forests, including recreation, range, and wildlife also contribute to the local economy. See the “Socioeconomic Resources” section of the FEIS.</p>
Support local traditional custom and culture	<p>The uses of livestock grazing, timber harvesting, mining, and hunting continue to be allowed in the proposed plan. The proposed plan acknowledges that many local residents have traditional ties, such as forest product collection, hunting, holiday celebrations, and annual picnics.</p>

Potential Impacts/Issues	How the Proposed Plan Addresses
	Loggers and ranchers continue to be an important part of the forests' history and their traditional uses remain an important part of the cultural landscape.
Rangeland resources management	The proposed plan promotes adaptive management to balance use by livestock, wild horses, and wildlife with estimated short- and long-term forage production. The plan provides direction to manage livestock grazing, invasive species (e.g., feral horses), and the Heber Wild Horse Territory.
Protect private property rights	The proposed plan honors the continuing validity of private, statutory, or pre-existing rights.
Consider local concerns, collaborate with government agencies, consult with tribes	Throughout the proposed plan, there is a management emphasis on collaboration and cooperation with Federal, State, and local governments, tribes, and stakeholders.
Growing demand for recreation (e.g., hiking trails, designated OHV routes)	<p>Desired Condition: The Apache-Sitgreaves NFs offer a spectrum of recreation settings and opportunities varying from primitive to rural and dispersed to developed, with an emphasis on the natural appearing character of the forests.</p> <p>Although the proposed plan does not identify specific new developments, it does allow for it, if needed. The proposed plan focuses on maintaining existing recreation opportunities and improving their quality.</p>
Manage recreation and impacts to communities	<p>The Apache-Sitgreaves NFS lands provide less developed opportunities than residents and visitors find in urban settings, such as greenbelts and parks.</p> <p>Desired Condition: The construction or placement of fences and gates, structures, signs, or other private property on NFS land (occupancy trespass) rarely occurs. Disposal of personal property (e.g., dumping) rarely occurs on NFS lands.</p> <p>Guideline: Access points to NFS land from adjacent non-NFS developments and subdivisions should be limited and provide all residents (not just edge lot owners) common entry points. Individual access points should be discouraged to minimize the development of unauthorized roads or trails.</p>
Tribal use and traditional cultural properties	<p>Desired Condition: Significant cultural resources (i.e., archaeological, historic, traditional cultural properties (TCP), known American Indian sacred sites) are preserved and protected for their cultural importance and are free from adverse impacts.</p> <p>Desired Condition: Members of affiliated tribes have access to gather forest resources and products for traditional cultural purposes (e.g., medicinal plants, boughs, basket materials, pollen, and plants and minerals for pigments).</p> <p>Desired Condition: Traditionally used resources are not depleted and are available for future generations.</p> <p>Desired Condition: Sacred sites and significant TCPs are accessible and free of adverse impacts allowing for culturally affiliated tribes to gather traditional forest products and conduct ceremonies.</p> <p>Desired Condition: All sacred objects, human remains, funerary objects, and objects of cultural patrimony removed from lands of Apache-Sitgreaves NFs have been repatriated to the appropriate tribe.</p>
Conserve, preserve, enhance, and	Desired Condition: Habitat quality, distribution, and abundance exist to

Potential Impacts/Issues	How the Proposed Plan Addresses
restore wildlife and their habitats	<p>support the recovery of federally listed species and the continued existence of all native and desirable nonnative species.</p> <p>Desired Condition: Habitat is well distributed and connected.</p> <p>In addition, the proposed plan focuses on restoring vegetative conditions and wildlife habitat.</p> <p>Desired Condition: Large blocks of habitat are interconnected, allowing for behavioral and predator-prey interactions, and the persistence of metapopulations and highly interactive wildlife species across the landscape. Ecological connectivity extends through all plant communities.</p> <p>Desired Condition: Wildlife are free from harassment and disturbance at a scale that impacts vital functions (e.g., breeding, rearing young) that could affect persistence of the species.</p> <p>The proposed plan also contains other desired conditions that benefit wildlife, including vegetation-specific desired conditions. In addition, the Wildlife Quiet Area Management Area focuses on wildlife habitat.</p>
Provide opportunities for wildlife-related recreation	<p>Desired Condition: Dispersed recreation opportunities (e.g., hunting, fishing, hiking, camping) are available and dispersed recreation sites (e.g., campsites, trailheads, vistas, parking areas) occur in a variety of ROS classes throughout the forests.</p> <p>Objective: Within the planning period, work with the AZGFD, ADOT, and other partners to provide at least 10 new wildlife viewing opportunities.</p>
Minimize impacts from invasive species	<p>Desired Condition: Invasive species (both and animal) are nonexistent or in low occurrence to avoid negative impacts to ecosystems.</p> <p>Objective: Annually, contain, control, or eradicate invasive species (e.g., musk thistle, Dalmatian toadflax) on 500 to 3,500 acres.</p> <p>Objective: Annually, control or eradicate invasive species (e.g., tamarisk, bullfrogs) on at least 2 stream miles.</p>
Provide opportunities for shooting sports, off-highway vehicles, and watercraft	<p>The proposed plan continues to allow these activities. The plan provides the framework for future travel management planning.</p>
Mineral and energy development	<p>The proposed plan provides direction to manage existing and potential mineral and development. It includes suitability determinations for energy corridor, other energy development, and communications sites.</p>
Threats related to changes in water availability	<p>Desired Condition: Water developments contribute to fish, wildlife, and riparian habitat as well as scenic and aesthetic values.</p> <p>Desired Condition: Apache-Sitgreaves NFs water rights are secure and contribute to livestock, recreation, wildlife, and administrative uses.</p> <p>Desired Condition: Surface water is not diminished by groundwater pumping.</p> <p>Desired Condition: Dams, diversions, or other water control structures are designed, maintained, and operated to conserve water resources.</p>
Threats related to changes in climate	<p>Appendix A of the proposed plan provides information and discussion about climate change and considerations for land management planning</p>

Potential Impacts/Issues	How the Proposed Plan Addresses
Public education to benefit wildlife	<p>Desired Condition: Forest visitors have access to information about topics of concern related to the Apache-Sitgreaves NFs (e.g., ecosystem restoration, unmanaged recreation, uncharacteristic wildfire), including appropriate visitor behavior (e.g., follow forest orders, pack out trash, appropriate sanitation, wildfire prevention).</p> <p>Desired Condition: Forest visitors have access to information about the features of the Apache-Sitgreaves NFs, its ecosystems, multiple uses, and other management aspects of the forests.</p> <p>Desired Condition: Interpretive information (e.g., ecology, wildlife, cultural resources, unique geologic features, Forest Service mission) is available to forest visitors at Apache-Sitgreaves NFs visitor centers, administrative offices, recreation sites, and along major forest roadways.</p>
Other	Appendix A of the FEIS addresses other potential impacts/issues highlighted during the 90-day public comment period.

Table 202. Activities on adjacent lands that may impact forest management

Activities	Possible Impact on Forest Management
Changes in land ownership	Commercial harvesting and thinning, forest restoration and thinning, removal of overstory trees/juniper treatments
Highway improvements	Prescribed fires
Fire suppression	Recreation improvements and new construction
Permitted recreation use (restrictions on types of uses)	Renewable energy development (e.g., wind farms, energy corridors)
Removal of nonnative fish species and restoration of native aquatic species	Continued livestock grazing
Noxious and invasive weed treatments	Four-Forest Restoration Initiative

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Appendix D. Management Area Descriptions

This appendix describes the management areas used in the alternatives. The action alternatives share a similar set of management areas. The no action alternative (1987 plan) used a different set of management areas. The management areas are described in this appendix and table 203 shows how they generally relate to one another.

Table 203. Crosswalk showing the general comparison of the action alternatives and the no action alternative management areas

Action Alternative Management Area		No Action Alternative Management Area(s)
General Forest	=	Forest Land, Woodland, Grasslands, Riparian, Water
Community-Forest Intermix	=	The 1987 plan does not contain a similar management area
High Use Developed Recreation Area	=	Developed Recreation Site
Energy Corridor	=	The 1987 plan does not contain a similar management area
Wild Horse Territory	=	The 1987 plan does not contain a similar management area
Wildlife Quiet Area	=	The 1987 plan does not contain a similar management area
Natural Landscape	=	The 1987 plan does not contain a similar management area
Recommended Research Natural Area	=	Research Natural Area
Research Natural Area	=	Research Natural Area
Primitive Area	=	Blue Range Primitive Area and Additions
Recommended Wilderness	=	The 1987 plan does not recommend any areas for wilderness designation
Wilderness	=	Bear Wallow Wilderness, Escudilla Wilderness, Mount Baldy Wilderness

Management Areas – Action Alternatives

There are 12 management areas identified in the action alternatives. A brief description of each follows. For more detailed information about these management areas, including suitability of various uses, see the proposed plan.

- **General Forest:** This management area allows the broadest variety of uses. These areas are managed to restore ecosystem integrity while providing for sustainable economic and social values and uses. A variety of forest products (commercial and noncommercial) are available that may contribute to local and regional communities. This management area contains undeveloped areas as well as developed facilities and open roads and trails.
- **Community-Forest Intermix:** This management area includes lands within ½ mile of communities-at-risk. Due to the threat of wildfire moving into or from developed areas, higher levels of management, including regular maintenance, may be needed to restore fire-adapted ecosystems.
- **High Use Developed Recreation Area:** This management area includes areas with high levels of developed recreation use that provide a wide variety of opportunities to a broad

- spectrum of visitors. High use developed recreation areas contain one or more facilities and may accommodate large numbers of people.
- **Energy Corridor:** This management area includes the three existing high power energy corridors. It is limited to the existing rights-of-way corridor. This area is managed to facilitate the operation and maintenance of the energy infrastructure.
 - **Wild Horse Territory:** This management area contains the Heber Wild Horse Territory. The territory was established in 1973 under the Wild Free Roaming Horse and Burro Act of 1971 with the purpose of providing use by and for the protection of wild horses.
 - **Wildlife Quiet Area:** This management area provides relatively undisturbed habitat where big game and other wildlife can reside with minimal disturbance from motorized vehicle use. Management activities, including habitat improvement projects, may occur in this area.
 - **Natural Landscape:** This management area is managed to retain its natural appearance and low level of development. It provides primitive and semi-primitive recreation opportunities, both nonmotorized and motorized. Management activities for ecological restoration purposes may occur, but are limited.
 - **Research Natural Area:** This management area is managed for scientific study and education. It also contributes to the maintenance of biological diversity.
 - **Recommended Research Natural Area:** These areas are recommended for designation as research natural areas.
 - **Wilderness:** Wilderness is managed to protect its values according to the Wilderness Act of 1964. Wilderness areas provide opportunities for solitude or a primitive and unconfined type of recreation and other ecosystem and societal benefits.
 - **Primitive Area:** This management area consists of the Blue Range Primitive Area and the Presidential recommended additions to the area. It is managed similar to wilderness, with one exception; the area is open to mineral prospecting and mineral development.
 - **Recommended Wilderness:** These areas are recommended for wilderness designation and are managed to retain wilderness characteristics.

Management Areas – No Action Alternative

There are 17 management areas used in the no action alternative (1987 plan). A brief description of each management area follows. For more details, see the 1987 “Apache-Sitgreaves National Forests Plan” (Forest Service, 1987).

- **Forest Land:** Forested lands managed for a variety of values and uses.
- **Woodland:** Woodlands managed for a variety of values and uses.
- **Riparian:** Riparian areas managed to maintain or improve conditions.
- **Grasslands:** Grasslands managed for a variety of values and uses.
- **Developed Recreation Sites:** This management area includes developed recreation facilities and the areas surrounding them.
- **Mount Baldy Wilderness:** Managed to protect wilderness values.
- **Blue Range Primitive Area and Additions:** Managed similar to wilderness, except open for mineral prospecting and development.
- **Escudilla Demonstration Area:** Area for scientific research on a variety of forest management practices.

- **Research Natural Area:** This management area contains one research natural area and four recommended areas that are managed for scientific study and education.
- **Water:** Management emphasis is the production of fish and wildlife and dispersed recreation use.
- **Bear Wallow Wilderness:** Managed to protect wilderness values.
- **Escudilla Wilderness:** Managed to protect wilderness values.
- **Black River:** Managed for possible inclusion into the Wild and Scenic River System.
- **West Fork Black River:** Managed for possible inclusion into the Wild and Scenic River System.
- **Chevelon Canyon:** Managed for possible inclusion into the Wild and Scenic River System.
- **East and West Forks Little Colorado River:** Managed for possible inclusion into the Wild and Scenic River System.
- **Sandrock:** An area deferred from livestock grazing to accelerate recovery of the watershed.

Appendix E. Other Supporting Documentation

The “Plan Set of Documents” is the complete set of documentation supporting the land management plan. It includes, but is not limited to, evaluation reports, documentation of public involvement, the plan including applicable maps, background documents, and applicable NEPA documents. The “Plan Set of Documents” is available in the Supervisor’s Office.

Some of the key components of the “Plan Set of Documents” are outlined in table 204.

Table 204. Other supporting documentation for the FEIS

Document	Description
FEIS Supporting Documents	
Specialist Reports: Air Quality, Soil, Water, Riparian, Watershed, Fisheries, Vegetation, Forest Health, Fire, Wildlife, Invasive Species, Recreation, Infrastructure, Eligible and Suitable Wild and Scenic Rivers, Wilderness Resources and Inventoried Roadless Areas, Research Natural Areas, Scenic Resources, Lands, Cultural Resources, American Indian Rights and Interests, Forest Products, Livestock Grazing, Minerals and Geology, and Socioeconomic	Specialist reports include supplementary information that may not appear in the FEIS including methodology, relevant laws, regulations, and policy, assumptions, adaptive management considerations, and other planning efforts.
Biological Assessment and Biological Evaluation	Evaluation of the effects of the preferred alternative to federally listed species and Regional Forester designated sensitive species.
Biological Opinion	The Biological Opinion is the result of the consultation process with USFWS and includes Incidental Take Statements, Conservation Recommendations, Reasonable and Prudent Measures, and Terms and Conditions relating to listed species which occur on the forests.
Species Viability Evaluations	Species viability evaluations are documented in the wildlife and fisheries specialist reports.
2012 Report on the Selection of Management Indicator Species and Ecological Indicators	Documents the process and rationale for selection of management indicator species (MIS) and ecological indicators (EI).
Apache-Sitgreaves National Forests Other Lands and Land Use Plans (May 2011)	A review of the planning and land use policies of other Federal agencies, State and local governments, and American Indian tribes.
Suitability Analyses	Suitability analyses for livestock grazing, timber, and recreation can be found in the respective specialist report.
Eligibility Report for the National Wild and Scenic River System (May 2009) Addendum to the Eligibility Report for the National Wild and Scenic River System (April 2012)	Documents the administrative review process, required by Forest Service policy, to identify rivers that are eligible for inclusion in the National Wild and Scenic River System. The addendum updates river conditions in light of the 2011 Wallow Fire.
Final Potential Wilderness Evaluation Reports (October 2012)	As required by the provisions of the 1982 Planning Rule, the Apache-Sitgreaves NFs developed an inventory of potential wilderness and evaluated each area.

Document	Description
Research Natural Area Evaluation (March 2012)	The RNA evaluation is documented in the Research Natural Area Specialist Report.
Scenery Management System (SMS) Inventory Report (March 2009)	Documents the SMS inventory and assessment process for the plan revision.
Need for Change	
Comprehensive Evaluation Report (December 2008)	This report highlights the social, economic, and ecological conditions and trends in and around the Apache-Sitgreaves, as detailed in the Ecological Sustainability Report, the Economic and Social Sustainability Assessment, and the Apache-Sitgreaves National Forests' Resource Evaluations. It summarizes the need for change for revising the 1987 plan.
CER Supplement to Meet AMS Requirements (March 2010)	Documents how the Apache-Sitgreaves NFs' assessments conform to the 1982 Planning Rule provisions.
Wallow Fire Changed Condition Assessment (December 2012)	Documents the change to existing conditions and the proposed plan caused by the 2011 Wallow Fire.
Recreation, Grazing, Minerals, and Timber Demand Analysis of the Management Situation (December 2009)	Estimates of recreation, grazing, mineral, and timber demand to help define need for change. Prepared by Joshua Wilson and Henry Eichman Economists TEAMS Planning Enterprise Unit
Apache-Sitgreaves NFs Planning Team Supplement to the Demand Report (February 2010)	Prepared by the Apache-Sitgreaves NFs' interdisciplinary (ID) planning team to supplement the above report.
Ecological Sustainability Report (December 2008)	Describes how the forests contribute to ecological sustainability and defines the ecological needs for change.
Economic and Social Sustainability Assessment (January 2009)	Describes how the forests contribute to social and economic sustainability and defines the social/economic needs for change.
Apache-Sitgreaves National Forests' Resource Evaluations (July 2008)	This document provides detailed information about the individual resource and program areas outlined in the Apache-Sitgreaves NFs' 1987 plan. It describes the current conditions and trends, how well the plan is working, and what needs to change.
Vegetation	
Mid-scale Existing Vegetation Map (2009, updated 2012)	Forestwide GIS map of vegetation type, canopy cover, and structure (size class).
Potential Natural Vegetation Types (PNVT) Map	Forestwide GIS map showing potential vegetation based on terrestrial ecosystem survey.
Ecological and Biological Diversity of National Forests in Region 3: Apache-Sitgreaves NFs (August 2006)	Describes the extent and distribution of PNVTs, condition of low-elevation grasslands, distribution of stream reaches with native fish, and species richness and conservation status. Prepared by The Nature Conservancy.
Historical Range of Variation for Potential Natural Vegetation Types of the Southwest	Consists of several papers that document the historical range of variation for various PNVTs (chaparral, aspen

Document	Description
(2006)	forest and woodland, Madrean encinal woodland, montane subalpine grassland, mixed conifer forest, piñon-juniper woodland, ponderosa pine forest, semi-desert grassland, and spruce-fir forest). Prepared by The Nature Conservancy.
Historic Fire Return Intervals for Arizona and New Mexico: A Regional Perspective for Southwestern Land Managers (April 2006)	Identifies the historic fire return intervals for 21 PNVTs throughout Arizona and New Mexico. Prepared by The Nature Conservancy.
Other Background Documents	
Forest Insect and Disease Activity on the Apache-Sitgreaves NFs and Fort Apache Indian Reservation (February 2010)	Summarizes the historic and contemporary disturbance information of the major forest insects and diseases. Prepared by Rocky Mountain Research Station and the Arizona Zone Office of Forest Health Protection.
Socioeconomic Assessment of the Apache-Sitgreaves National Forests (2005)	Provides a summary characterizing the social and economic environment surrounding the forests by showing the linkage between NFS lands and neighboring communities. Prepared by Arizona National Forests Socioeconomic Assessment Team and The University of Arizona School of Natural Resources. Manager's summary, annotated bibliography, and a supplement to the socioeconomic assessment are available.
Values, Attitudes, and Beliefs Toward National Forest System Lands: Arizona Tribal Peoples (April 2006)	Describes the context for tribal involvement in plan revision and management decisionmaking, the beliefs and values about the consultation process, and resource and multiple-use beliefs and values. Prepared by John C. Russell, Ph D. and Peggy A. Adams-Russell.
Values, Attitudes, and Beliefs Toward National Forest System Lands: The Apache-Sitgreaves National Forest (May 2006)	Describes the values, attitudes, and beliefs of local stakeholders toward the Apache-Sitgreaves NFs. Prepared by John C. Russell, Ph D. and Peggy A. Adams-Russell.
Collaboration	
Public Participation Plan	Outlines the public participation strategy for the plan revision process.
Collaboration Log	Spreadsheet that tracks public involvement and public contacts.
ReVision Review and Messages from the Forest Supervisor	Newsletters and updates sent to the plan revision mailing list and posted to the web to help inform stakeholders about the revision process.
Mailing lists	Mailing lists used for each public outreach effort.

Appendix F. Collaboration and Public Involvement

This appendix describes the collaborative process and key public involvement opportunities for the Apache-Sitgreaves NFs plan revision effort. More detailed information, including the Public Participation Plan (Forest Service, 2014b) and the Collaboration Log (Forest Service, 2014a), can be found in the “Plan Set of Documents.”

Plan Revision Timeline

Table 205 below provides a summary of the key steps in the Apache-Sitgreaves NFs’ plan revision process. Plan revision has been conducted under several different planning rules since revision activities began in 2006 (see information in the next section). This table also lists the planning rule that was in effect at various points in the process.

Table 205. Timeline of the Apache-Sitgreaves NFs’ plan revision process

Date Started	Key Step	Planning Rule in Effect
April 2006	Interdisciplinary (ID) planning team is formed to begin revision of the 1987 plan	2005
Spring 2006	Public and Forest Service employee meetings to identify need for change	2005
March 2007	U.S. District Court in California enjoined the Forest Service from using the 2005 planning rule	
April 2008	The 2008 planning rule is published in the Federal Register	
August 2008	Iterative Development of the Proposed Plan - the initial set of draft desired conditions is made available for review and comment	2008
September 2008	Iterative Development of the Proposed Plan - public meetings to gather feedback on the draft desired conditions	2008
December 2008	Comprehensive Evaluation Report and related documents (Ecological Sustainability Report and Economic and Social Sustainability Assessment) are available for review and comment	2008
December 2008	Notice of Initiation (to revise the forest plan) is published in the Federal Register	2008
June 2009	Iterative Development of the Proposed Plan - the Working Draft Land Management Plan is available for review and comment	2008
June 2009	U.S. District Court for the Northern District of California enjoined the Forest Service from using the 2008 planning rule	
December 2009	Notice of Intent (to revise the forest plan and to prepare an EIS) is published in the Federal Register; revision efforts proceed following the provisions of the 1982 Planning Rule	2000/1982
March 2010	Development of Initial Alternatives – public meetings to gather feedback on the initial alternatives	2000/1982
May 2010	Interdisciplinary (ID) planning team finalizes alternatives and begins analysis and development of the DEIS and proposed plan	2000/1982

Date Started	Key Step	Planning Rule in Effect
May 2011	Wallow Fire – 538,000 acre fire on the Apache National Forest interrupts plan revision	2000/1982
August 2011	ID planning team begins to inventory, assess, and document the changed conditions caused by the Wallow Fire. The information is used to update the DEIS	2000/1982
April 2012	The Forest Service publishes the final rule and record of decision for the 2012 planning rule	2012/1982
February 15, 2013	Publication of the Apache-Sitgreaves NFs proposed plan and DEIS in the Federal Register for public review and comment	2012/1982
February 15, 2013 – May 17, 2013	90-day public comment period for the proposed plan and DEIS	2012/1982
June 2015	Publication of the Apache-Sitgreaves NFs land management plan, FEIS, and ROD	2012/1982

Planning Rules

The National Forest Management Act (NFMA) of 1976 directs that every national forest or grassland managed by the Forest Service will develop and maintain a land management plan. The process for the development and revision of the plans, along with the required content of plans, is outlined in the planning regulations (planning rule). Individual forests and grasslands then follow the direction of the planning rule to develop a land management plan specific to their unit.

When the Apache-Sitgreaves NFs' plan revision started in 2006, the planning team followed direction under the 2005 Planning Rule, which had been finalized by the Forest Service and published in the Federal Register on December 22, 2004. The following year, on March 30, 2007, the U.S. District Court for the Northern District of California issued an injunction that ordered the Forest Service to discontinue use of the 2005 Planning Rule. The Apache-Sitgreaves NFs complied with the court order, and further planning activities undertaken were in compliance with laws and rulings not affected by the injunction. Much of the information and public comments gathered prior to the injunction remained useful in the planning effort. Work continued until finalization of the 2008 Planning Rule occurred on April 21, 2008. At that time, plan development began following guidance from the 2008 rule.

A little over a year later, on June 30, 2009, the 2008 Planning Rule was enjoined by the U.S. District Court for the Northern District of California and the revision of the Apache-Sitgreaves NFs plan was again interrupted. The U.S. Department of Agriculture subsequently determined on December 18, 2009, that plans could be amended, revised, or developed using the 2000 Planning Rule, as amended. The 2000 Planning Rule's transition provisions allowed use of the provisions of the planning rule in effect prior to the effective date of the 2000 rule, commonly called the 1982 Planning Rule. The Apache-Sitgreaves NFs' planning effort moved forward using the provisions of the 1982 Planning Rule and a notice of intent to revise the plan and publish a DEIS was published in the Federal Register on December 20, 2009.

The Forest Service published the current planning rule, the 2012 Planning Rule, in the Federal Register on April 9, 2012. The transition provision, 36 CFR § 219.17(b)(3), of the 2012 Planning

Rule allows the Apache-Sitgreaves NFs to continue to use the provisions of the 1982 planning to revise the plan.

Key Collaboration and Public Involvement Steps in the Revision Process

This section lists some of the key collaboration and public involvement activities that have occurred in the revision process. In addition to the activities listed in the tables below, several other tools were used to communicate with the public and other entities. Information about the process, including assessments, draft documents, timelines, letters, and meeting announcements were posted to the forests' Web site: <http://www.fs.usda.gov/asnf/>. Newspaper articles, radio announcements, flyers, legal notices, comment periods, presentations to groups, phone calls, one-on-one meetings, and other tools were used to share information about revision and gather input.

Identification of the Need for Change

The initial step in revising the Apache-Sitgreaves NFs' 1987 plan was to identify the need for change in the land management plan. Two primary methods were used to do this: (1) public and employee input and (2) science-based evaluations. A series of meetings and workshops were conducted to ask "what needs to change in the current forest plan or current forest management." Public and employee input was supplemented with science-based reports describing conditions, trends, and risks to sustainability that indicate where the 1987 plan does not provide adequate guidance for the present and future management of the forests. Some of the key actions taken to identify the need for change are outlined in table 206.

Table 206. Key actions related to the identification of the need for change

Date	Action	Description
2005	Report - Socioeconomic Assessment for the Apache-Sitgreaves National Forests	The report profiles the social and economic environment surrounding the Apache-Sitgreaves NFs.
March 2006	Mailing and Flyers	Letter to mailing list lets recipients know that the forests are beginning forest plan revision. Invites them to be involved by returning postcard so that the mailing list can be updated. Flyers distributed via frontliners, meetings, post offices, campgrounds, etc. Intent to notify folks this summer (especially visitors).
March 2006	Meetings with Employees	Meetings at all ranger districts and the Supervisor's Office to provide an overview of revision and conduct an exercise to identify geographic areas, themes, and need for change.
April 2006	Report – Values, Attitudes and Beliefs Toward National Forest System Lands: Arizona Tribal Peoples	The report contains information on values and beliefs of Arizona tribal peoples about national forest lands based on discussion/focus groups.

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Date	Action	Description
May 2006	Report - Values, Attitudes and Beliefs toward National Forest System Lands: The Apache-Sitgreaves National Forests	The report documents the results of a project to identify values, attitudes, and beliefs (VAB) about forest resources and their management for all national forests and grasslands in the Southwestern Region, including the Apache-Sitgreaves NFs.
May – July 2006	Meetings with Greenlee, Navajo, Apache Counties, Arizona Game and Fish Department (AZGFD), Natural Resource Conservation Service, and Natural Resource Conservation District (NRCD).	Meetings to provide an overview of plan revision and ask for input on the need for change.
July – September 2006 7/17 – Clifton 7/18 – Safford 7/19 – Greer 7/20 – Eagar/Springerville 8/1 – San Carlos 8/3 – Pinetop-Lakeside 8/9 – Whiteriver 8/10 – Alpine 8/29 – Heber/Overgaard/Forest Lakes 8/30 – Clay Springs/Linden/Pinedale 8/31 – Nutrioso 9/14 – Blue 9/19 – Vernon 9/21 – Snowflake/Taylor 9/27 – Winslow	Public Meetings	Meetings to share information about the forests, the new planning rule, the planning schedule, and how interested parties can become involved. Participants were asked what they value about the national forests, what significant changes have occurred over the last 20 years, and what forest managers should focus on during the next 20 years. Participants encouraged to join discussion groups to further explore topics or issues.
October 2006	Mailing – Letter from the Forest Supervisor	A followup to the July-Sept 2006 public meetings – the letter explains where to find meeting notes and announces the next round of public meetings.
October – November 2006	Comment Analysis	ID planning team reviews public comments and summarizes need for change.
December 2006	Mailing – ReVision Review Newsletter	Newsletter outlines what we've heard so far as well as background on revision and how folks can become involved.

Date	Action	Description
January 2007 1/9 – Clifton 1/11 – Alpine 1/16 – Eagar 1/17 – Heber/Overgaard 1/18 – Show Low	Public Meetings/Workshops	Meetings to obtain more information about issues/topics. Participants asked to share what they feel is a priority (or are priorities) to focus on during revision.
January – February 2007	Employee Meetings	Meetings to gather feedback from employees on issues/topics and what they feel is a priority (or are priorities) to focus on during revision.
February 2007	Mailing – Message from the Forest Supervisor	Followup to January 2007 public meetings. The letter explains where to find meeting notes and discusses the development of the Comprehensive Evaluation Report, next meetings, and dates for upcoming meetings on the Tonto NF.
March 2007 3/5 Mesa 3/13 Cave Creek	Public Meetings – Tonto NF	During Tonto NF revision meetings, provide status of the Apache-Sitgreaves NFs revision process and encourage folks to sign up for the mailing list and submit comments.
March 2007	Meeting with local, state, and tribal representatives – social and economic sustainability assessment	Opportunity for participants to provide feedback on the draft social and economic sustainability assessment.
April 2007	Public Meetings Sponsored by the Arizona Game and Fish Department	Arizona Game and Fish Department informational meetings on how to become involved in the process of Federal land management plan. Forest representatives attend and answer questions.
July 2007	Mailing – ReVision Review Newsletter	Newsletter outlines the key findings of assessments, public input, and need for change and requests comments.
August 2007	Wildlife Discussion Group	A group of interested publics, Forest Service, and other agency representatives meet to discuss the key findings from the draft ecological sustainability report and species list.
October 2007	Mailing – Update from the Forest Supervisor	The letter includes information about new proposed planning rule, upcoming public meeting to share technical information regarding processes, and science used in the upcoming need for change report. Next step together (sometime in 2008) will be describing the desired ecological, economic, and social outcomes of forest management.
November 2007	Public Meeting – Findings from the Sustainability Reports	A public meeting to share the more technical findings regarding need for change. The findings are a result of the work completed so far on the social-economic and ecological sustainability reports.

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Date	Action	Description
November 2007	Meeting - Range Discussion Group	A group of interested publics, Forest Service, and other agency representatives discuss status of revision and next steps of revision process: desired conditions and objectives.
April 2008	Mailing – Message from the Acting Forest Supervisor	Letter announces retirement of former Forest Supervisor Elaine Zieroth, release of the 2008 Planning Rule, and notice of amendment to current 1987 plan.
June 2008	Meeting – Wildlife Discussion Group	A group of interested publics, Forest Service, and other agency representatives meet to review and refine the species diversity lists.
July 2008	Report – Forest Plan Revision Resource Evaluations	The report details information about individual resource and program areas outlined in the 1987 Apache-Sitgreaves NFs plan.
December 2008	Mailing – ReVision Review Newsletter	Newsletter provides status of revision, including message from new forest supervisor, upcoming publication of the NOI, and summary of need for change.
December 2008	Report – Ecological Sustainability Report	Report about the ecological environment of the Apache-Sitgreaves NFs and the surrounding area. This report profiles the diversity of ecosystems and species, and identifies threats and associated risks. It also provides information regarding needs for ecological change.
December 2008	Report – Comprehensive Evaluation Report	This report highlights the social, economic, and ecological conditions and trends in and around the forests, as detailed in the Ecological Sustainability Report, the Economic and Social Sustainability Assessment, and the Resource Evaluations.
December 2008	Notice of Initiation	The Notice of Initiation to begin forest plan revision was published in the Federal Register on 12/16/2008. The legal notice was published in the White Mountain Independent.
January 2009	Report – Economic and Social Sustainability Assessment	The report documents the Apache-Sitgreaves NFs contribution to economic and social sustainability within the assessment area.
May 2009	Report – Eligibility Report of the National Wild and Scenic River System	Comprehensive evaluation of the potential for rivers on the Apache-Sitgreaves NFs to be eligible for inclusion into the National Wild and Scenic River System. Note: addendum completed in April 2012
June 2009	Report – Draft Potential Wilderness Evaluation	Draft reports made available for public comment. The Forest Service evaluated all lands possessing wilderness characteristics for potential wilderness during plan revision. The reports presents the evaluation findings.

Date	Action	Description
June 2009	Comment Analysis	ID planning team reviews comments received during the Notice of Initiation comment period and validates the need for change topics
February 2010	Report – Forest Insect and Disease Activity on the Apache-Sitgreaves NFs and Forest Apache Indian Reservation	An assessment of insect and disease impacts.
March 2010	Report – CER Supplement to Meet AMS Requirements	The provisions of the 1982 Planning Rule require the completion of an Analysis of the Management Situation (AMS). The previously published Comprehensive Evaluation Report met most of this requirement. This report addresses the remaining AMS requirements. Note: planning team supplement completed February 2010
December 2010	Report – Final Potential Wilderness Evaluation	Reports for those lands that were evaluated and met the criteria for potential wilderness. Note: reports updated and additional reports completed in 2012

Iterative Development of the Proposed Plan

The next stage of the revision process was to develop the proposed plan. Initial efforts were focused on describing the desired conditions for the forests. Desired conditions are the social, economic, and ecological attributes toward which management of the land and resources is to be directed. After using public and employee input to refine the desired condition statements, the next step was to draft the remaining plan components. The Working Draft Land Management Plan was published to provide a foundation for collaborative discussion and feedback which evolved into the proposed plan. Table 207 identifies some of the key actions completed during the iterative development of the proposed plan.

Table 207. Key actions related to the iterative development of the proposed plan

Date	Action	Description
August 2008	Initial Draft Desired Conditions	The initial set of draft desired conditions are available for review and input.
August 2008	Mailing – Message from the Acting Forest Supervisor	Letter provides an update on revision, including upcoming open houses and an initial draft desired conditions packet.
August – October 2008	Employee Meetings	Meetings to provide status of revision, summary of need for change, what the revised forest plan will look like, and obtain feedback on initial draft desired conditions.
September 2008 9/3 – Alpine 9/4 – Show Low 9/5 – Springerville 9/9 – Overgaard 9/11 – Clifton	Public Meetings – Initial Draft Desired Conditions	Open houses to answer questions and gather input on the initial draft desired conditions.
October 2008	Comment Analysis	ID planning team reviews public comments on the initial draft desired conditions and uses input to update desired condition language.
December 2008	Newsletter – ReVision Review	Newsletter shares status of revision, including message from the new Forest Supervisor, upcoming publication of the NOI, and summary of need for change.
April-May 2009	Employee Meetings	Meetings provide overview of the upcoming working draft plan, how it is organized, and request comment and feedback.
June 2009	Working Draft Land Management Plan	The Working Draft Land Management Plan is made available and serves as a foundation for collaborative discussion and feedback.
June 2009	Mailing – Message from the Forest Supervisor & Users Guide to the Working Draft Plan	Letter includes a status of revision and announces release of the Working Draft Land Management Plan for review. Attached is a Users Guide of the Working Draft Plan to aid review.
August 2009	Mailing – Message from the Forest Supervisor	Letter includes update on status of revision, including update on enjoyment of 2008 Planning Rule and discontinued use of the 2008 Planning Rule.
September 2009	Comment Analysis	ID planning team reviews public comments on the Working Draft Land Management Plan and uses input to modify draft plan language and identify issues.
December 2009	Mailing – Message from the Forest Supervisor	Letter includes update on status of plan revision and announces upcoming publication of Notice of Intent in the Federal Register. Also announces that the revision process will follow the provisions of the 1982 Planning Rule.

Date	Action	Description
December 2009	Notice of Intent	The Notice of Intent to revise the forest plan and prepare an environmental impact statement (EIS) published in the Federal Register on 12/29/2009. Legal notice published in White Mountain Independent.
March –May 2010	Meetings – Catron County Board of Commissioners, Arizona Game and Fish Department, Greenlee County Board of Supervisors.	Meetings to provide update on forest activities, including plan revision.

Development of the Draft Environmental Impact Statement

The next stage in the revision process was to develop alternatives to address issues not covered by the proposed plan. Once the alternatives were identified, the planning team began to develop the draft environmental impact statement (DEIS). The DEIS analyzes the effects of implementing the alternatives. Table 208 outlines some of the key actions taken during the development of the DEIS.

Table 208. Key actions related to the development of the DEIS

Date	Action	Description
March 2010	Initial Draft Alternatives	The initial draft alternatives and associated maps (e.g., management areas, suitability) are made available for review and comment.
March 2010	Mailing – Message from the Forest Supervisor	Letter includes update on progress of revision, the upcoming development of an EIS, explanation of alternatives, presents the initial draft alternatives developed by the forest, asks for comment, and announces open house meetings in April. Includes detailed description of the four initial draft alternatives.
March - April 2010	Employee Meetings	Meetings to discuss and gather feedback on the initial draft alternatives.
April 2010 4/12 – Clifton 4/14 – Heber/Overgaard 4/15 – Lakeside 4/19 – Eagar	Public Meetings	Public open house forum meetings to discuss initial draft alternatives and gather feedback.
May 2010	Comment Analysis	ID planning team reviews public comments on initial draft alternatives and uses to refine alternatives.
August 2010	Mailing - Postcards	Postcards sent to the mailing list. Recipients are asked to identify the format (e.g., printed, electronic) of DEIS they prefer.
September 2010	Mailing – Message from the Forest Supervisor	Letter includes reference to the comments received on the initial draft alternatives and current status of revision.

Date	Action	Description
May–June 2011	Wallow Fire	The 538,000-acre Wallow Fire burns on the Apache NF. Progress on plan revision is interrupted.
August 2011	Mailing – Message from the Forest Supervisor	Letter provides the status of forest plan revision post-Wallow Fire. ID planning team is assessing changes and working on proposed plan and DEIS.
January 2012	Meetings – Greenlee County Board of Supervisors, Apache County Natural Resource Conservation District, Navajo County, Arizona Game and Fish Department	Meetings with forest supervisor and deputy forest supervisor to discuss status of plan revision.
May 2012	Mailing – Message from the Forest Supervisor	Letter provides update on status of revision: ID planning team is developing the DEIS. The proposed plan and DEIS are scheduled to be available for review and comment this fall. Letter references new planning rule and states that the forests are still following the provisions of the 1982 Planning Rule.
January–March 2013	Employee Meetings	Meetings to discuss the upcoming release of the proposed plan and DEIS.
February 4, 2013	Mailing – Letter from the Forest Supervisor	Letter announces the availability of the proposed plan, DEIS, and associated documents for review. Also anticipates the publication of the Notice of Availability to occur on February 15, 2013.
February 15, 2013	Notice of Availability (NOA)	NOA published in the Federal Register on Friday, February 15, 2013, announces the release of the proposed plan and DEIS. The publication of the NOA begins the 90-day public comment period.
February 2013 2/26 – Show Low 2/27 – Springerville 2/28 – Duncan (Clifton)	Public Meetings	Open house format public meetings to discuss the proposed plan and DEIS.

Development of the Final Proposed Plan and Environmental Impact Statement

The last stage in the revision process was to develop the final proposed land management plan (plan) and final environmental impact statement (FEIS) and to document the responsible official's decision in the record of decision (ROD). Table 209 outlines some of the key actions taken during the finalization of these documents.

Table 209. Key actions related to the development of the final proposed plan and FEIS

Date	Action	Description
May 2013 – April 2014	Analysis of Public Comment	The forests received over 41,000 comment letters. Of these letters, 145 letters contained unique and substantially different comments. In addition 7 different form letters were received. The planning team, with the assistance of the TEAMS enterprise team, read, sorted, grouped, and responded to public comments. These responses are located in appendix A of this FEIS. The plan and FEIS reflect changes resulting from public and internal comments.
March 2014	Mailing – Letter from the Forest Supervisor	Letter provides an update on the status of plan revision. Describes current efforts (comment analysis, consultation) and estimates the release of the plan and FEIS in fall 2014.
May 2015	State Historic Preservation Office	The Arizona SHPO declined to comment on the DEIS or Draft Land Management Plan.
Sept 2013 – May 2015	Consultation with the U.S. Fish and Wildlife Service	The forests consulted with USFWS on the effects of implementation of the Revised Land Management Plan on federally listed species on the forests. This consultation resulted in the issuance of a Biological Opinion, which is available on the forests' planning web page. http://www.fs.usda.gov/detail/asnf/landmanagement/planning/
June 2015	Notice of Availability (NOA) and Record of Decision (ROD)	The NOA was published in the Federal Register [citation]. The Record of Decision was signed on [date] and is available on the forests' planning web page. http://www.fs.usda.gov/detail/asnf/landmanagement/planning/

Tribal Consultation

The Apache-Sitgreaves NFs have consulted with nine tribes and one chapter that use the forests for traditional, cultural, or spiritual activities. The following tribes and chapter were consulted: White Mountain Apache Tribe, San Carlos Apache Tribe, Hopi Nation, Navajo Nation, Pueblo of Zuni, Yavapai-Apache Tribe, Tonto Apache Tribe, Fort McDowell Yavapai Nation, Yavapai-Prescott Indian Tribe, and the Ramah Chapter of the Navajo Nation.

Tribes were initially informed about plan revision in October 2006, through a letter explaining the revision process and extending an open invitation to meet with the Apache-Sitgreaves NFs. A consultation letter was sent to the tribes in June 2009, asking for input on the working draft land management plan. In December of 2009, the tribes were sent a letter that provided the status of revision and the upcoming publication of the notice of intent (NOI) and invited their comments and concerns. In addition to consultation, the tribes have been included in all public outreach efforts throughout the plan revision process.

Three tribes provided written responses: White Mountain Apache Tribe, Navajo Nation, and Tonto Apache Tribe. Consultation meetings were held with the San Carlos Apache Tribe (August and November 2006), White Mountain Apache Tribe (August 2006, March 2007, April 2010), Navajo Nation (August 2006, September 2008, December 2009), Hopi Tribe (August 2006, November 2009), and Pueblo of Zuni (August 2006, September 2008, July 2011).

Tribes were sent a copy of the proposed land management plan and DEIS for their review in February 2013, slightly before the documents were released to the public. The Yavapai-Prescott Tribe provided written comments.

References

U.S. Forest Service. (2014a). Apache-Sitgreaves National Forests. Collaboration Log. Springerville, AZ.

U.S. Forest Service. (2014b). Apache-Sitgreaves National Forests. Public Participation Plan. Springerville, AZ.

Appendix G. Plan Decisions and Species Viability

The following table (table 210) provides a crosswalk that shows how fine filter plan decisions meet species viability needs. More detailed information on individual species and the species viability analysis can be found in the “Wildlife Specialist Report – Viability” (Forest Service, 2012b) and the “Fisheries Specialist and Viability Report” (Forest Service, 2014a).

As part of the plan revision process, coarse filter plan decisions (i.e., desired condition statements) were developed that describe the desired outcomes and conditions for vegetation, riparian, and aquatic features, and other resources within the planning area. These desired conditions provide habitat for wildlife which helps to reduce risks to species and provides for their viability. Where desired conditions would result in low to moderate risk ratings for some species, meeting and maintaining those desired conditions would provide for their population viability. This is because low to moderate ratings of risk are assumed to be similar enough to normal ecosystem fluctuations and therefore within a species’ ability to adjust, thus posing little risk to viability. Where the risk rating would be moderately-high, high, or very high, additional fine filter plan components (e.g., standards, guidelines) were developed to address or mitigate risk. However, the coarse-fine filter approach is not entirely discrete in that standards and guidelines can contribute to viability for some coarse filter species; while the needs of fine filter species can also be provided for, in part, by coarse filter desired conditions and PNVTs.

The crosswalk in table 210 lists those fine filter plan decisions that reduce risks to species and provide for viability. Other plan decisions (objectives, special areas, suitability, and monitoring) and management area allocations also contribute to species viability and are discussed in the “Wildlife and Rare Plants” and “Fisheries” sections of chapter 3 of the FEIS.

In the table below, the following abbreviations are used:

ST = standard

GL = guideline

PNVT = potential natural vegetation type

FPS = forest planning species

Table 210. Species crosswalk for how plan decisions meet species' viability needs

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
All PNVTs, all habitat elements, and other factors of concern	All FPS	<p>GLs for Soil: Projects with ground-disturbing activities should be designed to minimize long- and short-term impacts to soil resources. Where disturbance cannot be avoided, project-specific soil and water conservation practices should be developed.</p> <p>Severely disturbed sites should be revegetated with native plant species when loss of long-term soil productivity is predicted.</p> <p>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 nonnative plants at a State-certified seed testing laboratory before acceptance and mixing.</p> <p>Coarse woody debris retention and/or creation should be used as needed to help retain long-term soil productivity.</p> <p>GL for Water Resources: Projects with ground-disturbing activities should be designed to minimize long and short-term impacts to water resources. Where disturbance cannot be avoided, project-specific soil and water conservation practices and best management practices (BMPs) should be developed.</p> <p>ST for All PNVTs: Vegetation treatments shall include measures to reduce the potential for the introduction of invasive plants and animals and damage from nonnative insects and diseases.</p> <p>GLs for All PNVTs: 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.</p> <p>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.</p> <p>GLs for Wildlife and Rare Plants and Aquatic Habitat and Species: Management and activities should not contribute to a trend toward the Federal listing of a species.</p> <p>Activities occurring within federally listed species habitat should apply habitat management direction and species protection measures from recovery plans.</p> <p>The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebb 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.</p> <p>ST for Invasive Species: 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 nonnative</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
		<p>populations.</p> <p>GLs for Invasive Species: Project areas should be monitored to ensure there is no introduction or spread of invasive species.</p> <p>Treatment of invasive species should be designed to effectively control or eliminate them; multiple treatments may be needed.</p> <p>GLs for Landscape Scale Disturbance Events: 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.</p> <p>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 PNV(s).</p> <p>GL for Motorized Opportunities: 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.</p> <p>ST for Forest Products: 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).</p> <p>GLs for Livestock Grazing: Grazing use on seasonal allotments should be timed to the appropriate plant growth stage and soil moisture.</p> <p>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.</p> <p>GL for Wildlife Quiet Area Management Area: 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.</p> <p>ST for Wilderness Management Area: Human-caused disturbed areas that do not complement wilderness characteristics will be rehabilitated to a natural appearance, using plant species or other materials native to the area.</p> <p>ST for Recommended Wilderness Management Area: Human-caused disturbed areas that do not complement wilderness characteristics shall be rehabilitated to a natural appearance, using plant species or other materials native to the area.</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
		<p>GL for Research Natural Area Management Area: To minimize impacts to unique and sensitive plant species, recreational activities (other than use on the designated trail) should not be encouraged.</p> <p>GL for Recommended Research Natural Area Management Area: To minimize impacts to unique and sensitive plant and animal species, recreational activities should not be encouraged.</p>
Forested PNVTs	All FPS listed under ponderosa pine, dry mixed conifer, wet mixed conifer and spruce-fir forested PNVTs	<p>GLs for All Forested PNVTs: 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).</p> <p>Healthy southwestern white pine should be retained to maintain the wide range of genetic variability that contributes to resistance against the nonnative white pine blister rust disease.</p> <p>Tree species that are less susceptible to root disease should be retained within areas of root disease infection to reduce spread of disease.</p> <p>When thinning dwarf mistletoe infected sites, as much mistletoe should be removed as possible without sacrificing the healthiest, most desirable trees for the particular site (in some situations this may involve retaining some trees in the upper canopy that are lightly infected to meet multiple resource objectives).</p> <p>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.</p> <p>Hiding cover, approach cover (by waters), and travel corridor cover should be provided where needed by wildlife.</p> <p>GLs for Wildlife and Rare Plants: 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, in drainages, at the base of slopes, and on northerly (northwest to northeast) aspects. Nest areas should be 25 to 30 acres each in size.</p> <p>Northern goshawk post-fledging family areas (PFAs) of approximately 420 acres in size should be designated around the nest sites.</p> <p>During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs.</p> <p>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.</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
Ponderosa pine forested PNVT	Arizona myotis bat, Abert's squirrel, northern goshawk, zone-tailed hawk, Grace's warbler, flammulated owl, Mexican spotted owl (where Gambel oak)	<p>GL for Ponderosa Pine: 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.</p> <p>GL for Wildlife and Rare Plants: 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.</p>
Dry mixed conifer forested PNVT	Arizona myotis bat, red squirrel, northern goshawk, flammulated owl, Mexican spotted owl	<p>GL for Dry Mixed Conifer: 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.</p> <p>GL for Aspen: Restoration of aspen clones should occur where aspen is overmature or in decline to maintain a sustainable presence of this species at the landscape level.</p> <p>GL for Wildlife and Rare Plants: 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.</p>
Wet mixed conifer forested PNVT	red squirrel, black bear, northern goshawk, red-faced warbler, dusky blue grouse, MacGillvray's warbler, Mexican spotted owl, yellow lady's slipper, wood nymph, heathleaf ragwort, yellow Jacob's-ladder, hooded lady's tresses	<p>GL for Aspen: Restoration of aspen clones should occur where aspen is overmature or in decline to maintain a sustainable presence of this species at the landscape level.</p> <p>GL for Wildlife and Rare Plants: 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.</p>
Spruce-fir forested PNVT	red squirrel, black bear, Mexican spotted owl, crenulate moonwort, White Mountains paintbrush, yellow lady's slipper, wood nymph, heathleaf ragwort, yellow Jacob's-ladder, hooded lady's tresses	<p>GL for Wildlife and Rare Plants: 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.</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
Madrean pine-oak woodland PNVNT	mule deer (winter), juniper titmouse, Mexican spotted owl (often in association with canyons), gray vireo, Bigelow's onion	<p>GL for All Woodland PNVNTs: 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.</p> <p>GL for Madrean pine-oak woodland: Where Mexican spotted owls are found nesting in canyons or on north slopes within the Madrean pine-oak woodland, adjacent treatments should be modified to meet the needs of foraging owls.</p> <p>GLs for Wildlife and Rare Plants: 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.</p> <p>During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs.</p> <p>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.</p>
Montane/subalpine grasslands PNVNT	pronghorn antelope, Gunnison's prairie dog, dwarf shrew, savannah sparrow, splachnoid dung moss	<p>ST for ALL PNVNTs: Within each PNVNT, vegetation management activities shall be designed to maintain or move plant composition towards a moderate to high plant community similarity as compared to site potential.</p> <p>GLs for Grasslands: 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.</p> <p>Pronghorn antelope fence and other crossings should be installed along known movement corridors to prevent habitat fragmentation.</p> <p>GLs for Wildlife and Rare Plants: 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.</p> <p>Prairie dog controls should not be authorized except when consistent with approved State of Arizona Gunnison's prairie dog conservation strategies.</p> <p>GL for Livestock Grazing: Grazing use on seasonal allotments should be timed to the appropriate plant growth stage and soil moisture.</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
Great Basin grassland PNVNT	pronghorn antelope, Gunnison’s prairie dog, Arizona sunflower	<p>ST for ALL PNVNTs: Within each PNVNT, vegetation management activities shall be designed to maintain or move plant composition towards a moderate to high plant community similarity as compared to site potential.</p> <p>GLs for Grasslands: 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.</p> <p>Pronghorn antelope fence and other crossings should be installed along known movement corridors to prevent habitat fragmentation.</p> <p>GLs for Wildlife and Rare Plants: 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.</p> <p>Prairie dog controls should not be authorized except when consistent with approved State of Arizona Gunnison’s prairie dog conservation strategies.</p>
Semi-desert grassland PNVNT	Bigelow’s onion, Arizona sunflower, superb penstemon	<p>ST for All PNVNTs: Within each PNVNT, vegetation management activities shall be designed to maintain or move plant composition towards a moderate to high plant community similarity as compared to site potential.</p> <p>GLs for Grasslands: 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.</p> <p>Pronghorn antelope fence and other crossings should be installed along known movement corridors to prevent habitat fragmentation.</p> <p>GL for Wildlife and Rare Plants: 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.</p>
Sometimes shaded or often wet meadow or forest opening (ponderosa pine, dry mixed conifer, wet mixed	Mogollon vole, Merriam’s shrew, four-spotted skipperling butterfly, Arizona sneezeweed, Mogollon clover, Oak Creek triteleia	<p>GL for All PNVNTs: 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).</p> <p>GL for Ponderosa Pine and Dry Mixed Conifer Forests: 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</p>

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<p>conifer, and spruce-fir forested and Madrean pine-oak woodland PNVTs)</p>		<p>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.</p> <p>GL for Riparian Areas: 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.</p> <p>GL for Wildlife and Rare Plants: 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.</p> <p>GLs for Motorized Opportunities: 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.</p> <p>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.</p> <p>GL for Nonmotorized Opportunities: New nonmotorized 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.</p> <p>GL for Livestock Grazing: Critical areas (e.g., meadows) should be managed to address the inherent or unique site factors, condition, values, or potential conflicts.</p> <p>GL for Special Uses: 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).</p>
<p>Cool understory micro-climate</p> <p>(dry mixed conifer forested and Madrean pine-oak woodland PNVTs)</p>	<p>Goodding’s onion, Mexican hemlock parsley</p>	<p>GLs for Wildlife and Rare Plants: 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, western yellow-billed cuckoo).</p> <p>The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebb 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.</p> <p>GL for Special Uses: 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).</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
<p>Mosaic of conditions</p> <p>(species that need adjacent untreated areas for persistence)</p>	<p>lesser long-nosed bat, long-tailed vole, dwarf shrew, White Mountains ground squirrel, Springerville pocket mouse, western burrowing owl, Montezuma’s quail, plateau giant tiger beetle, Greene milkweed</p>	<p>GL for All PNVTs: 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).</p> <p>GL for Wildlife and Rare Plants: 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.</p> <p>ST for All PNVTs: Within each PNVT, vegetation management activities shall be designed to maintain or move plant composition towards a moderate to high plant community similarity as compared to site potential.</p>
<p>Dense, low-mid canopy with ample ground vegetation/litter and/or woody debris</p> <p>(dry mixed conifer, wet mixed conifer, and spruce-fir forested and riparian forested PNVTs)</p>	<p>southern red-backed vole, dusky blue grouse, western red bat, ocelot, White Mountains chipmunk, black bear, red-faced warbler, MacGillivray’s warbler (mixed broadleaf deciduous riparian forest), Swainson’s thrush, gray catbird (riparian forested PNVTs), southwestern willow flycatcher (montane willow riparian forest)</p>	<p>GL for Soil: Coarse woody debris retention and/or creation should be used as needed to help retain long-term soil productivity.</p> <p>GLs for Wildlife and Rare Plants: 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.</p> <p>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, western yellow-billed cuckoo).</p>
<p>Seasonally wetted swales</p> <p>(montane/subalpine and Great Basin grassland PNVTs)</p>	<p>Ferris’ copper butterfly, Alberta arctic butterfly, nitocris fritillary butterfly, nokomis fritillary butterfly, Parish alkali grass (alkali soils only)</p>	<p>GL for All PNVTs: 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).</p> <p>GL for Special Uses: 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).</p>
<p>High quality water</p> <p>(all riparian PNVTs)</p>	<p>water shrew, bald eagle, Arizona toad, Chiricahua leopard frog, northern leopard frog, lowland leopard frog, northern</p>	<p>GL for Aquatic Habitat and Species: Sufficient water should be left in streams to provide for aquatic species and riparian vegetation.</p> <p>GLs for Riparian Areas: 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.</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
	<p>Mexican gartersnake, narrow-headed gartersnake, false amelethus mayfly, California floater, Mosely caddisfly, Arizona snaketail dragonfly, White Mountains water penny beetle, Three Forks springsnail, Blumer’s dock, carnivorous bladderwort, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace</p>	<p>Equipment should be fueled or serviced outside of riparian areas to prevent spills that could impair water quality or harm aquatic species.</p> <p>Construction or maintenance equipment service areas should be located and treated to prevent gas, oil, or other contaminants from washing or leaching into streams.</p> <p>GLs for Water Resources: 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.</p> <p>Streamside management zones should be in place between streams and disturbed areas and/or road locations to maintain water quality and suitable stream temperatures for aquatic species.</p> <p>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.</p> <p>Constraints (e.g., maximum limit to which water level can be drawn down, 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.</p> <p>Short-term impacts in watersheds containing Outstanding Arizona Waters may be allowed when long-term benefits to water quality, riparian areas, and aquatic resources would occur.</p> <p>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 should not result in leaks.</p> <p>GLs for Wildlife and Rare Plants: 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.</p> <p>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.</p> <p>ST for Dispersed Recreation: 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.</p> <p>ST for Motorized Opportunities: Road maintenance and construction activities shall be designed to reduce sediment (e.g., water bars, sediment traps, grade dips) while first providing for user safety.</p> <p>GL for Motorized Opportunities: New roads, motorized trails, or designated motorized areas should be</p>

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		<p>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.</p> <p>GL for Nonmotorized Opportunities: New nonmotorized 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.</p> <p>GL for Livestock Grazing: 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 nutritional supplements should also be located to minimize herbivory impacts to aspen clones.</p> <p>STs for Water Uses: Special uses for water diversions shall maintain fish, wildlife, and aesthetic values and otherwise protect the environment.</p> <p>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.</p> <p>Groundwater withdrawals shall not measurably diminish surface waterflows on NFS lands without an appropriate surface water right.</p>
<p>Healthy riparian conditions (i.e., well vegetated and untrampled streambanks and floodplains)</p> <p>(all riparian PNVTs)</p>	<p>Arizona montane vole, water shrew, NM meadow jumping mouse, southwestern willow flycatcher, peregrine falcon, Lincoln’s sparrow (montane willow riparian forest), northern Mexican gartersnake, narrow-headed gartersnake, Blumer’s dock, Arizona willow (montane willow riparian forest only), Bebb willow, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace</p>	<p>GLs for Aquatic Habitat and Species: 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.</p> <p>Sufficient water should be left in streams to provide for aquatic species and riparian vegetation.</p> <p>Projects and activities should avoid damming or impounding free-flowing waters to provide streamflows needed for aquatic and riparian-dependent species.</p> <p>GLs for Riparian Areas: Ground-disturbing projects (including prescribed fire) which may degrade long-term riparian conditions, should be avoided.</p> <p>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.</p> <p>Active grazing allotments should be managed to maintain or improve to desired riparian conditions.</p> <p>ST for Water Resources: Consistent with existing water rights, water diversions or obstructions shall at all times allow sufficient water to pass downstream to preserve minimum levels of waterflow which maintain aquatic life and other purposes of national forest establishment.</p> <p>GL for Wildlife and Rare Plants: Modifications, mitigations, or other measures should be incorporated to</p>

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		<p>reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.</p> <p>ST for Motorized Opportunities: Road maintenance and construction activities shall be designed to reduce sediment (e.g., water bars, sediment traps, grade dips) while first providing for user safety.</p> <p>GLs for Motorized Opportunities: 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.</p> <p>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.</p> <p>Roads and motorized trails removed from the transportation network should be treated in order to avoid future risk to hydrologic function and aquatic habitat.</p> <p>GL for Nonmotorized Opportunities: New nonmotorized 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.</p> <p>GLs for Livestock Grazing: Critical areas (e.g., riparian) should be managed to address the inherent or unique site factors, condition, values, or potential conflicts.</p> <p>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.</p> <p>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 nutritional supplements should also be located to minimize herbivory impacts to aspen clones.</p> <p>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).</p> <p>GL for Minerals and Geology: Streambed and floodplain alteration or removal of material should not occur if it prevents attainment of riparian, channel morphology, or streambank desired conditions.</p> <p>GLs for Energy Corridor Management Area: Trees and shrubs in riparian areas should only be removed</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
		<p>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.</p> <p>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.</p>
<p>Large trees, snags, and/or dense canopies (mixed broadleaf deciduous, cotton-willow, and montane willow riparian forested PNVTs)</p>	<p>beaver, greater western mastiff bat, Allen’s big-eared bat, Arizona gray squirrel, common black-hawk, evening grosbeak, yellow-billed cuckoo, bald eagle</p>	<p>GLs for Wildlife and Rare Plants: 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.</p> <p>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, western yellow-billed cuckoo).</p> <p>During treatments, snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs.</p> <p>GL for Landscape Scale Disturbance Events: 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.</p>
<p>Permanent wet meadow-like areas</p> <p>(wetland/cienega riparian areas PNVT including fens and bogs)</p>	<p>Ferris’ copper butterfly, nitocris fritillary butterfly, nokomis fritillary butterfly, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace</p>	<p>GL for All PNVTs: 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).</p> <p>GL for Aquatic Habitat and Species: 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.</p> <p>GL for Motorized Opportunities: 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.</p> <p>GL for Nonmotorized Opportunities: Meadow crossings should be designed or redesigned to maintain or restore hydrologic function using appropriate tools such as French drains and elevated culverts.</p> <p>GL for Special Uses: 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).</p>
<p>Canyon slopes/cliffs, caves, rocky slopes (often in vicinity of riparian areas, often cool micro-</p>	<p>Townsend’s big-eared bat, spotted bat, greater western mastiff bat, Allen’s big-eared bat, peregrine falcon,</p>	<p>GLs for Wildlife and Rare Plants: 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.</p> <p>Rare and unique features (e.g., talus slopes, cliffs, canyon slopes, caves, fens, bogs, sinkholes) should be</p>

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climate) (all PNVTs)	Eastwood alumroot, Arizona alumroot, Davidson’s cliff carrot	protected to retain their distinctive ecological functions and maintain viability of associated species. The needs of localized species (e.g., New Mexico meadow jumping mouse, Bebb 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. GL for Special Uses: 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).
Habitat connectivity (all PNVTs)	Mexican wolf, jaguar, mountain lion, black bear, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace	<p>GL for All PNVTs: 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.</p> <p>GL for Aquatic Habitat and Species: Sufficient water should be left in streams to provide for aquatic species and riparian vegetation.</p> <p>GL for All Woodland PNVTs: Hiding cover, approach cover (by waters), and travel corridor cover should be provided where needed by wildlife.</p> <p>GL for Wildlife and Rare Plants: 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.</p> <p>GLs for Overall Recreation Opportunities: Developed and dispersed recreation sites and other authorized activities should not be located in places that prevent wildlife or livestock access to available water. Constructed features should be maintained to support the purpose(s) for which they were built. Constructed features should be removed when no longer needed.</p> <p>GL for Motorized Opportunities: Roads and motorized trails should be designed and located so as to not impede terrestrial and aquatic species movement and connectivity.</p> <p>GL for Nonmotorized Opportunities: New trails and trail relocations should be designed and located so as to not impede terrestrial and aquatic species movement and connectivity.</p> <p>ST for Livestock Grazing: New or reconstructed fencing shall allow for wildlife passage, except where specifically intended to exclude wildlife (e.g., elk fencing).</p> <p>GLs for Wildlife Quite Area Management Area: 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.</p> <p>Hiding cover and travelways for wildlife should be maintained to provide for security and connectivity of habitat.</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
		<p>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.</p>
<p>Collection or loss from management</p>	<p>nitocris fritillary butterfly, nokomis fritillary butterfly, yellow lady's slipper, hooded lady's tresses, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace</p>	<p>ST for Aquatic Habitat and Species: 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).</p> <p>GL for Aquatic Habitat and Species: When new water diversions are created or existing water diversions are reanalyzed, measures should be taken to prevent entrapment of fish and aquatic organisms.</p> <p>GL for Wildlife and Rare Plants: 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.</p> <p>GL for Wildlife and Rare Plants: 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.</p> <p>GL for Invasive Species: Pesticide use should minimize impacts on non-target plants and animals.</p> <p>ST for Forest Products: 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).</p> <p>GL for Forest Products: Permits issued for forest products should include stipulations to protect resources.</p> <p>ST for Special Uses: 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 onsite.</p> <p>GL for Special Uses: 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).</p> <p>GLs for Research Natural Area Management Area: Management measures should be used (e.g., fencing) to protect unique features.</p> <p>To minimize impacts to unique and sensitive plant species, recreational activities, other than use on the designated trail, should not be encouraged.</p> <p>Research special use authorizations should limit impacts to sensitive resources, unique features, and species within the RNA.</p> <p>GLs for Recommended Research Natural Area Management Area: To minimize impacts to unique and sensitive plant and animal species, recreational activities should not be encouraged.</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
		<p>If necessary, recommended RNAs should be fenced to manage unique features.</p> <p>Research special use authorizations should limit impacts to sensitive resources, unique features, and species within recommended RNAs.</p> <p>Recommended RNAs should be managed for nonmotorized access within the area to minimize ground disturbances and protect the resources which make these areas unique.</p>
Nest parasitism	southwestern willow flycatcher, Grace's warbler	<p>GL for Wildlife and Rare Plants: 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.</p> <p>ST for Invasive Species: 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 nonnative populations.</p>
Disease	Townsend's big-eared bat, spotted bat, western red bat, Arizona toad, Chiricahua leopard frog, northern leopard frog, lowland leopard frog, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace	<p>GL for Aquatic Habitat and Species: To prevent degradation of native species habitat and the incidental or accidental introduction of diseases or nonnative species, aquatic species should not be transferred through management activities from one 6th level HUC watershed to another.</p> <p>GL for Wildlife and Rare Plants: 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.</p> <p>GL for Livestock Grazing: 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.</p> <p>GLs for Minerals and Geology: 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.</p> <p>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).</p>
Entrapment	FPS that are small mammals, bats, young of other species, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach	<p>GLs for Aquatic Habitat and Species: Sufficient water should be left in streams to provide for aquatic species and riparian vegetation.</p> <p>When new water diversions are created or existing water diversions are reanalyzed, measures should be taken to prevent entrapment of fish and aquatic organisms.</p> <p>GL for Wildlife and Rare Plants: Modifications, mitigations, or other measures should be incorporated to</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
	minnow, and spikedace	<p>reduce negative impacts to plants, animals, and their habitats and to help provide for species needs, consistent with project or activity objectives.</p> <p>STs for Livestock Grazing: New or reconstructed fencing shall allow for wildlife passage, except where specifically intended to exclude wildlife (e.g., elk fencing).</p> <p>New livestock watering facilities shall be designed to allow wildlife access and escape.</p> <p>GL for Livestock Grazing: During maintenance of existing watering facilities, escape ramps that are ineffective or missing should be replaced.</p> <p>GLs for Special Uses: Environmental disturbance should be minimized by co-locating pipelines, power lines, fiber optic lines, and communications facilities.</p> <p>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.</p> <p>GL for Wildlife Quite AreaManagement Area: 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.</p>
Substantial predation or competition from invasive species	pronghorn antelope, Three Forks springsnail, Apache trout, Gila chub, Gila trout, Little Colorado spinedace, roundtail chub, loach minnow, and spikedace	<p>ST for All PNVTs: Vegetation treatments shall include measures to reduce the potential for the introduction of invasive plants and animals and damage from nonnative insects and diseases.</p> <p>GL for Aquatic Habitat and Species: To prevent degradation of native species habitat and the incidental or accidental introduction of diseases or nonnative species, aquatic species should not be transferred through management activities from one 6th level HUC watershed to another.</p> <p>GL for Wildlife and Rare Plants 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.</p> <p>ST for Invasive Species: 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 nonnative populations.</p> <p>GL for Invasive Species: Projects and activities should not transfer water between drainages or between unconnected waterbodies within the same drainage to avoid spreading disease and aquatic invasive species.</p> <p>ST for Special Uses: Noxious plants and nonnative invasive species monitoring and control shall be included in contracts, permits, and agreements.</p> <p>GL for High Use Developed Recreation AreaManagement Area: Management should focus on</p>

PNVT, Habitat Element, or Other Factors of Concern	Associated Forest Planning Species (FPS)	Plan Decisions That Address Risks to Species Viability
		<p>operation and maintenance, safety, aesthetics, and control of noxious weeds and nonnative invasive species.</p> <p>GL for Energy Corridor Management Area: Invasive plant species should be aggressively controlled within energy corridors to prevent or minimize spread.</p>
<p>Intentional harassment, forced removal, or avoidable disturbance</p>	<p>Mexican wolf, Gunnison’s prairie dog, black bear, many FPS (at least during important life cycle periods)</p>	<p>GL for All Forested PNVTs: Hiding cover, approach cover (by waters), and travel corridor cover should be provided where needed by wildlife.</p> <p>GL for All Woodland PNVTs: Hiding cover, approach cover (by waters), and travel corridor cover should be provided where needed by wildlife.</p> <p>GLs for Wildlife and Rare Plants: 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.</p> <p>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, western yellow-billed cuckoo).</p> <p>GL for Wildland Fire Management: Firelines, helispots, and fire camps should be located to avoid disturbance to critical species and impacts to cultural resources.</p> <p>GLs for Overall Recreation Opportunities: Developed and dispersed recreation sites and other authorized activities should not be located in places that prevent wildlife or livestock access to available water.</p> <p>Food and other items that attract wildlife should be managed to prevent reliance on humans and to reduce human-wildlife conflicts.</p> <p>GLs for Dispersed Recreation: Timing restrictions on recreation uses should be considered to reduce conflicts with wildlife needs or soil moisture conditions.</p> <p>Dispersed campsites should not be located on or adjacent to archaeological sites or sensitive wildlife areas.</p> <p>ST for Developed Recreation: Where trash facilities are provided, they shall be bear resistant.</p> <p>GLs for Special Uses: 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.</p> <p>The use of underground utilities should be favored to avoid potential conflicts with resources (e.g., scenic integrity, wildlife, wildfire, heritage).</p> <p>GLs for Minerals and Geology: 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.</p>

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		<p>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).</p> <p>GLs for Wildlife Quiet Area Management Area: All WQAs should be managed to preclude snowmobile use to minimize disturbance during the critical winter period.</p> <p>WQA boundaries should be signed to identify the areas and educate the public about their purpose.</p> <p>GL for Research Natural Area Management Area: Research special use authorizations should limit impacts to sensitive resources, unique features, and species within the RNA.</p> <p>GL for Recommended Research Natural Area Management Area: Research special use authorizations should limit impacts to sensitive resources, unique features, and species within recommended RNAs.</p>

References

U.S. Forest Service. (2014a). Fisheries Specialist and Viability Report Forest Plan Revision FEIS. Springerville, AZ.

U.S. Forest Service. (2014b). Wildlife Specialist Report - Viability. Springerville, AZ.

