



United States Department of Agriculture

Draft Assessment Report of Ecological/Social/Economic Sustainability Conditions and Trends

Gila National Forest, New Mexico



Forest Service

Gila National Forest

September 2016

Cover Photo: Whitewater Baldy Fire in the Mogollon Mountains by Micah Kiesow

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at http://www.ascr.usda.gov/complaint_filing_cust.html and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer and lender.

Draft Assessment Report Gila National Forest, New Mexico

For More Information Contact:

Gila National Forest

Plan Revision Team

3005 E. Camino del Bosque Silver City, NM 88061

Phone: 575-388-8280

Email: gilaplan@fs.fed.us Website: <http://go.usa.gov/h88k>

Abstract:

The Assessment Report presents and evaluates existing information about relevant ecological, economic, and social conditions, trends, and risks to sustainability and their relationship to the 1986 Gila National Forest Land and Resource Management Plan (forest plan), within the context of the broader landscape.

Contributors:

- Matt Schultz, Forest Plan Revision Lead and Forest Planner
- Rene Guaderrama, Forest Plan Revision Wildlife Lead
- Nessa Natharius, Forest Plan Revision Soil Scientist and Watershed Lead
- Mitchel White, Forest Plan Revision Ecological Lead
- Jim Apodaca, Forest Plan Revision Recreation Lead
- Harley Allsup, Facilities/Project Engineer
- John Baumberger, Lands & Minerals Program Specialist
- Eric Flood, Recreation Planner
- Josh Hall, Regional Air and Water Quality Specialist
- Leroy Holguin, Fire and Fuels Planner
- Delilah Jaworski, Social Scientist
- Micah Kiesow, Soil Scientist
- Nori Koehler, Soil Scientist
- Carolyn Koury, Watershed & Air Program Manager
- Jerry Monzingo, Wildlife, Fish, and Rare Plant Program Manager
- Lisa Mizuno, Environmental Coordinator
- Mike Natharius, Soil Scientist
- Dustin Myers, Fisheries Biologist
- Rex Null, Road Engineer
- Brian Park, GIS Coordinator
- Gabe Partido, Timber Program Manager
- Teresa Smergut, Range Program Manager
- Wendy Sutton, Archeologist and Tribal Liaison
- Matthew Taliaferro, Assistant North Zone Archaeologist
- Art Telles, Planning and Natural Resources Staff Officer
- Laura Vallejos, Silviculturalist
- Tracy Weber, Recreation, Heritage, Engineering, Lands, and Minerals Staff Officer

Special recognition and thanks to the Regional Office reviewers and “A-Team” - Matt Turner, Ernie Taylor, Jack Triepke, Priya Shahani, Yvette Paroz, Roy Jemison, Jarl Moreland, Dan Ryerson, and Wayne Robbie for their help and guidance through the assessment process.

Table of Contents

Table of Contents	iii
Introduction to the Assessment.....	1
Section I: Ecological Integrity and Sustainability	9
Chapter 1. Ecological Integrity and Sustainability	11
Chapter 2. Upland Vegetation	17
Chapter 3. Baseline Carbon Assessment	173
Chapter 4. Soil.....	187
Chapter 5. Air.....	210
Chapter 6. Water	229
Chapter 7. Riparian.....	341
Chapter 8. At-Risk Species	389
Chapter 9. System Drivers and Stressors.....	442
Section II. Social, Economic and Cultural Sustainability	477
Chapter 10. Social, Cultural, and Economic Conditions	481
Chapter 11. Multiple Uses and Their Economic Contributions	513
Chapter 12. Recreation.....	541
Chapter 13. Designated Areas	581
Chapter 14. Infrastructure.....	615
Chapter 15. Land Status and Ownership, Use and Access Patterns.....	627
Chapter 16. Energy and Mineral Resources	645
Chapter 17. Cultural and Historic Resources.....	661
Chapter 18. Areas of Tribal Importance	715
Chapter 19. Social, Economic and Cultural Sustainability Integrated Risk	727
References	731
Appendix A. Local Unit Development Process.....	789
Appendix B. Carbon Assessment Methods.....	791
Appendix C. Air NAAQS NMAAQs	799
Appendix D. Water.....	800
Appendix E. Economic Contribution Analysis Methods and Data	884
Appendix F. Mineral Withdrawals.....	889
Appendix G. Species Justifications	894

List of Tables

Table 1. Example of a decision matrix to assess Ecological Response Unit (ERU) risk	13
Table 2. Ecological Response Units of the Gila National Forest	15
Table 3. Sample vegetation seral states, successional structure and respective composition, cover, and departure index (DIR) from reference condition (RC) for the mountain mahogany mixed shrubland (MMS) ERU on the Gila NF and within the greater context area (CA)	21
Table 4. Definition of patch size departure based on current patch size in relation to a reference range of patch sizes.	23
Table 5. Definitions of fire frequency departure based on current fire return interval in relation to a range of reference mean fire return intervals (MFR).....	24
Table 6. Plan scale departure as represented by FRCC classes I through III	24
Table 7. Land area, in acres, of the Gila NF in relation to the context area (CA) of the ecoregion sections and 28 subsections in which it occurs	33
Table 8. Relative proportional representation of upland ERUs on the Gila NF and within the greater context area (CA) (column 4b) and seral state departure from reference condition (columns 5a and 5b)	34
Table 9. Gila NF's upland ERU acreage distribution at the local unit scale	36
Table 10. Rare ERUs within the Forest and/or the context area.....	40
Table 11. Variability of upland ERU departure from reference conditions (RC) ¹ is displayed	42
Table 12. Climate change vulnerability assessment rating for the upland ERUs on the Gila NF along with an uncertainty qualifier.	43
Table 13. PPF ERU acreage and percent within the local units	46
Table 14. Seral state make-up of the PPF ERU under reference condition (RC) and current conditions for both the Gila NF and context area (CA).	48
Table 15. Gila NF ponderosa pine forest ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³	49
Table 16. Gila NF local unit PPF 19-year average annual acres burned by wildfire and percent burn severity by local unit.....	52
Table 17. Gila NF Ponderosa pine forest ERU risk assessment matrix	54
Table 18. Gila NF MCD ERU acreage and percent within the local units.....	55
Table 19. Seral state make-up of the MCD ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).....	58
Table 20. Gila NF mixed conifer-frequent fire forest ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³	59
Table 21. Gila NF local unit MCD 19-year average annual acres burned by wildfire and percent burn severity by local unit.....	61
Table 22. Gila NF Mixed conifer-frequent fire forest ERU risk assessment matrix	63
Table 23. PPE ERU acreage and percent within the local units.....	64
Table 24. Seral state make-up of the PPE ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).....	67
Table 25. Gila NF ponderosa pine-evergreen oak forest ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³	68
Table 26. Gila NF local unit PPE 19-year average annual acres burned by wildfire and percent burn severity by local unit.....	70
Table 27. Gila NF Ponderosa pine-evergreen oak forest ERU risk assessment matrix	72
Table 28. Mixed conifer w/ aspen forest ERU acreage and percent distribution at the local unit scale	73
Table 29. Seral state make-up of the MCW ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).....	76
Table 30. Gila NF mixed conifer w/ aspen forest ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³	77
Table 31. Gila NF local unit MCW 19-year average annual acres burned by wildfire and percent burn severity by local unit.....	79
Table 32. Gila NF Mixed conifer w/ aspen forest ERU risk assessment matrix	80
Table 33. Spruce-fir forest (SFF) ERU acreage distribution at the local unit scale	82
Table 34. Seral state make-up of the SFF ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).....	85
Table 35. Gila NF spruce-fir forest ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³ ..	86
Table 36. Gila NF local unit SFF 19-year (1996-2015) average annual acres burned by wild fire and percent burn severity by local unit	88
Table 37. Gila NF Spruce-fir forest ERU risk assessment matrix	89
Table 38. Piñon-juniper woodland (PJO) ERU acreage and percent within the local units.....	91
Table 39. Seral state make-up of the PJO ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).....	94

Table 40. Piñon-juniper woodland ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³ .	95
Table 41. Gila NF local unit PJO 19-year average annual acres burned by wildfire and percent burn severity by local unit.	97
Table 42. Gila NF Piñon-juniper woodland ERU risk assessment matrix.	98
Table 43. Piñon-juniper grass (PJG) ERU acreage distribution and percent within the local units.	100
Table 44. Seral state make-up of the PJG ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).	103
Table 45. Gila NF piñon-juniper grass woodland ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³ .	104
Table 46. Gila NF local unit PJG 19-year average annual acres burned by wildfire and percent burn severity by local unit.	106
Table 47. Gila NF Piñon-juniper grass woodland ERU risk assessment matrix.	107
Table 48. Juniper-grass woodland (JUG) ERU acreage distribution at the local unit scale.	109
Table 49. Seral state make-up of the JUG woodland ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).	112
Table 50. Gila NF juniper-grass woodland ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UC) ³ .	113
Table 51. Gila NF local unit JUG acres burned by wildfires and percent burn severity by local unit.	115
Table 52. Gila NF Juniper grass woodland ERU risk assessment matrix.	116
Table 53. Madrean piñon-oak ERU acreage distribution at the local unit scale.	118
Table 54. Seral state make-up of the MPO ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).	121
Table 55. Gila NF Madrean piñon-oak woodland ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³ .	122
Table 56. Gila NF local unit MPO 19-year average annual acres burned by wildfire and percent burn severity by local unit.	124
Table 57. Gila NF Madrean piñon-oak woodland ERU risk assessment matrix.	125
Table 58. Piñon-juniper evergreen oak ERU acreage distribution and percent within the local units.	126
Table 59. Seral state make-up of the PJC ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).	129
Table 60. Gila NF local unit PJC 19-year average annual acres burned by wildfire and percent burn severity by local unit.	132
Table 61. Gila NF Piñon-juniper/evergreen shrub woodland risk assessment matrix.	133
Table 62. Mountain mahogany mixed shrubland ERU acreage percent within the local units.	134
Table 63. Seral state make-up of the MMS ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).	136
Table 64. Gila NF mountain mahogany mixed shrubland ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³ .	137
Table 65. Gila NF local unit MMS 19-year average annual acres burned by wildfire and percent burn severity by local unit.	139
Table 66. Gila NF mountain mahogany mixed shrubland ERU risk assessment matrix.	140
Table 67. Montane/subalpine grasslands ERU acreage and percent within the local units.	141
Table 68. Seral state make-up of the MSG ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).	144
Table 69. Gila NF montane/subalpine grasslands ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³ .	145
Table 70. Gila NF local unit MSG 19-year (1996-2015) average annual acres burned by wildfire and percent burn severity by local unit.	147
Table 71. Gila NF Montane/subalpine grasslands ERU risk assessment matrix.	148
Table 72. Colorado Plateau/Great Basin grasslands ERU acreage distribution at the local unit scale.	149
Table 73. Seral state make-up of the CPGB ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).	152
Table 74. Colorado Plateau/Great Basin grasslands ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³ .	153
Table 75. Gila NF local unit CPGB 19-year (1996-2015) average annual acres burned by wildfire and percent burn severity by local unit.	155
Table 76. Gila NF Colorado Plateau/Great Basin grasslands ERU risk assessment matrix.	156
Table 77. Semi-desert grassland ERU acreage distribution at the local unit scale.	157
Table 78. Seral state make-up of the SDG ERU under reference (RC) and current conditions for both the Gila NF and context area (CA).	160
Table 79. Gila NF semi-desert grassland ERU climate change vulnerability assessment (CCVA) ^{1, 2} and uncertainty assessment (UA) ³ .	161
Table 80. Gila NF local unit SDG 19-year (1996-2015) average annual acres burned and percent burn severity by local unit.	163

Table 81. Gila NF Semi-desert grassland risk assessment matrix.....	164
Table 82. Coarse woody debris (tons/acre) and snag (snags/acre) density for each ERU at the Forest scale†.....	166
Table 83. Average patch size (acres) for each ERU at the Forest scale.....	167
Table 84. Fire frequency (years) for each ERU at context area, Forest, and local scales.....	168
Table 85. Fire severity for each ERU at context area, Forest, and local scales.....	169
Table 86. Fire regime condition class for each ERU for the Forest and local units.....	171
Table 87. Gila NF Insects and diseases impacts; acres and percent of each ERU, and largest single year of recorded effects (1997-2014). ERUs are arranged by percent of area showing effects.....	171
Table 88. Major Ecological Response Units on the Gila NF in acres and percent.....	174
Table 89. Biomass carbon stock per ERU in reference and current conditions.....	175
Table 90. Projected Carbon Stocks for Major ERUs of the Gila NF.....	177
Table 91. Proportion of constituents of wildfire emissions for both greenhouse gases (GHG) and carbon compounds (NRC 2004).....	178
Table 92. Soil Organic Carbon by ERU.....	182
Table 93. Comparison of soil and biotic taxonomic classifications.....	194
Table 94. Risk matrix for soil resource characteristics.....	204
Table 95. Risk matrix for soil loss.....	204
Table 96. Risk summary for key characteristics of soil.....	205
Table 97. Characteristics of air quality monitoring sites relevant to the Gila airshed.....	212
Table 98. Summary of conditions, trends, and reliability of assessment.....	228
Table 99. Key water resource characteristics for assessment.....	229
Table 100. Watershed Condition Classification model.....	234
Table 101. Current watershed conditions and departure across the plan area.....	235
Table 102. Context area subbasin extent and Gila NF percent.....	242
Table 103. Risk matrix for watershed condition.....	243
Table 104. Subwatershed indicators contributing to watershed risk.....	245
Table 105. Subwatershed indicators contributing to local unit risk.....	246
Table 106. Extent and distribution of perennial and intermittent stream miles for plan area watersheds and the Gila NF.....	248
Table 107. Extent and distribution of perennial stream miles for subbasins within the context area and the Gila NF.....	256
Table 108. Risk matrix for representativeness and redundancy analysis results.....	257
Table 109. A comparison of annual streamflow characteristics and climatic variables at Gila near Gila between the reference and current time periods.....	265
Table 110. Streamflow risk matrix.....	270
Table 111. Percentage of local unit and Forest area in each streamflow risk category.....	271
Table 112. Miles of assessed streams, those that are meeting all State water quality standards and impaired miles for plan area watersheds.....	274
Table 113. Plan area watershed total and Gila NF impaired stream miles by cause of impairment.....	278
Table 114. Interpreting benthic macroinvertebrate data to water quality status with respect to designated aquatic life use in wadeable, perennial streams.....	288
Table 115. M-SCI scores for stations on the Gila NF.....	289
Table 116. Outstanding National Resource Waters and impairment status.....	293
Table 117. Impaired stream miles and Gila NF percent of impaired miles, subbasin area and stream miles.....	297
Table 118. Context area miles of impairment by cause.....	298
Table 119. Water quality risk matrix.....	299
Table 120. Native fish species changes in distribution.....	301
Table 121. Reference (R) and current (C) occurrences of native fish species for plan area watersheds and subwatersheds.....	302
Table 122. Native and non-native fish distribution within perennial stream miles by subwatershed.....	312
Table 123. Plan area extent and distribution of springs, seeps and non-riverine wetlands.....	322
Table 124. Extent and distribution of springs and seeps, and non-riverine wetlands within the context area.....	329
Table 125. Risk matrix for representativeness and redundancy analysis results.....	330
Table 126. Water resources risk summary by characteristic at the watershed, Forest and local unit scales.....	336
Table 127. Observable change in riparian canopy cover, erosion and/or sedimentation since 2011.....	344
Table 128. Local unit contributions to the cottonwood group of ERUs.....	351
Table 129. Riparian ERUs represented in the cottonwood group.....	352
Table 130. Area-weighted seral state make-up of the cottonwood group under reference (RC) and current conditions for both the Gila NF and context area.....	353
Table 131. Current riparian/wetland vegetation conditions at the plan scale for cottonwood group ERUs.....	356
Table 132. Channel shape and function conditions at the plan scale for cottonwood group ERUs.....	356

Table 133. Local unit contributions to the montane-conifer willow group of ERUs	360
Table 134. Riparian ERUs represented in the montane-conifer willow group.....	360
Table 135. Area-weighted seral state make-up of the montane-conifer willow group ERUs under reference (RC) and current conditions for both the Gila NF and context area	361
Table 136. Current riparian/wetland vegetation conditions within the plan area for montane-conifer willow group ERUs	364
Table 137. Channel shape and function conditions within the plan area for montane-conifer willow group ERUs.....	364
Table 138. Local unit contributions to the Herbaceous Riparian ERU	367
Table 139. Riparian ERUs represented in the wetland (ciénega) group.	367
Table 140. Seral state make-up of the wetland (ciénega) group ERU under reference (RC) and current conditions for both the Gila NF and context area (CA)	368
Table 141. Local unit contributions to the walnut-evergreen tree group of ERUs	372
Table 142. Riparian ERUs represented in the Arizona walnut ERU	372
Table 143. Seral state make-up of the walnut-evergreen tree group ERU under reference (RC) and current conditions for both the Gila NF and context area.....	373
Table 144. Local unit contributions to the desert willow group of ERUs.....	376
Table 145. Riparian ERUs represented in the desert willow group.....	376
Table 146. Seral state make-up of the desert willow group under reference (RC) and current conditions for both the Gila NF and context area	377
Table 147. Magnitude and return interval for Mogollon Creek and the San Francisco, Gila and Mimbres Rivers, entire period of record.....	379
Table 148. Departure in flood frequency for the Gila NF riparian ERUs and groups	381
Table 149. Risk matrix for riparian ecosystem characteristics	382
Table 150 . ERU and group risk by ecosystem characteristic	383
Table 151. Seral state proportion risk by local unit	384
Table 152. Local unit and Forest risk for ecosystem characteristics other than seral state proportion	385
Table 153. Federally listed threatened or endangered species listed for the four-county area (Catron, Grant, Hidalgo, and Sierra) of the Gila National Forest.	390
Table 154. NatureServe Ranking Descriptions	395
Table 155. Species known to occur in the plan area and carried forward for consideration as potential species of conservation concern.	397
Table 156. Potential species of conservation concern removed from further analysis, and rationale for removal	405
Table 157. Potential species of conservation concern for the Gila National Forest.....	409
Table 158. Federally listed (*) and potential species of conservation concern currently known to occur in the plan area and associated ecological response unit types, riparian/aquatic habitats, and features.	412
Table 159. Federally listed species and potential species of conservation concern summarized by taxonomic group and their associated ERUs, riparian/aquatic habitat, and features.	415
Table 160. Key ecosystem characteristics associated with federally listed species (*) and potential species of conservation concern known to currently occur in the plan area	417
Table 161. Federally listed, proposed, and potential species of conservation concern summarized by taxonomic group and associated local scale on the Gila National Forest.....	418
Table 162. Federally listed species relevant to the plan area.	419
Table 163. Potential Species of Conservation Concern (SCCs) relevant to the plan area.	425
Table 164. Snow pack characteristics by subbasin and watershed ¹	445
Table 165. Comparison of reference and current precipitation for the New Mexico Southwestern Mountains climate division	449
Table 166. Comparison of reference and current precipitation for the New Mexico Southern Desert climate division.....	449
Table 167. Ecological Response Units of the Gila NF and the summarized Climate Change Vulnerability Assessment vulnerability and uncertainty ratings	452
Table 168. Climate change vulnerability ratings for Gila NF riparian ERUs.....	454
Table 169. Road density in the upland ERUs of the Gila NF.....	471
Table 170. Road density in the riparian ERUs of the Gila NF.	471
Table 171. Those who self-identify as Hispanic, within the area of influence (4 counties), New Mexico, and the U.S.	487
Table 172. Language spoken at home in the area of influence, New Mexico, and the U.S.	487
Table 173. Education attainment within the area of influence, New Mexico, and U.S.	488
Table 174. 2014 employment levels by industry classification for Gila NF area of influence.	490
Table 175. Median Household Income	491
Table 176. Share of Labor and Non-Labor Income	491
Table 177. Agricultural statistics on the number and size of farms and ranches.....	493
Table 178. Total homes and wildland-urban interface homes in the area of influence and New Mexico.....	495

Table 179. Current Contribution of the Gila National Forest to the Regional Economy	505
Table 180. Current Contribution of the Gila National Forest by Program Area	506
Table 181. Payments in Lieu of Taxes (PILT) to the States and Counties, FY 2015.....	508
Table 182. Secure Rural Schools and Community Self-Determination Act, FY 2014 Payments.....	508
Table 183. Gila National Forest’s average management activity treatment (acres) by Ecological Response Unit* from 1996 to 2014	515
Table 184. Volume sold on the Gila National Forest by product and fiscal year in million cubic feet (MMCF).	516
Table 185. Grazing allotments on the Gila National Forest by ranger district (2016).	523
Table 186. Number of cattle, farm and ranches, and cash receipts from cattle/calve production from the New Mexico Agricultural Statistics (2012-2014) for New Mexico and counties which include the Gila National Forest (USDA 2014). ..	529
Table 187. Sportsmen participation and expenditures statewide and by county by activity in 2013.	538
Table 188. Total number of jobs, income, and taxes statewide and by county from hunting, trapping, and fishing in 2013.	538
Table 189. Number of outfitter and guide permits issued annually from 2010 to 2015 on the Gila National Forest and total reported revenue.	539
Table 190. Recreation Opportunity Spectrum (in acres and percentage) on the Gila NF	544
Table 191. Distribution of Site Type Used between 2006 and 2011	546
Table 192. Main activities by percent for the Gila NF compared to the National Average.....	548
Table 193. Number of annual visits by individuals to the Gila NF between 2006 and 2011 by percent.	549
Table 194. NVUM survey data for visitation to the Gila NF by Race/Ethnicity	550
Table 195. Recreation buildings on the Gila National Forest, with their facility condition ratings	554
Table 196. Inventoried Roadless areas, Gila National Forest.....	596
Table 197. Eligible Wild and Scenic Rivers on the Gila NF.....	597
Table 198. Critical habitat area on Gila National Forest, by species	607
Table 199. Annual road maintenance needs by maintenance level	619
Table 200. Miles of Gila National Forest roads by maintenance level	620
Table 201. Administrative buildings on the Gila National Forest, with their facility condition ratings.....	621
Table 202. Recreation buildings on the Gila National Forest, with their facility condition ratings.....	622
Table 203. Land ownership (percent) in the counties that include the Gila NF	628
Table 204. Designated Communication/Electronic Sites on the Gila National Forest	639
Table 205. Significant metal deposits in the context area, by mining district, based on past production and known resources.	649
Table 206. Early Spanish entradas entering New Spain along the Camino Real.	675
Table 207. Spanish and Mexican land grants established within 50 miles of the Plan Area.....	678
Table 208. Armed confrontations led by Victorio from September, 1879 through October, 1880.	682
Table 209. Civilian Conservation Corps camps established in the Plan Area.	684
Table 210. Archaeological survey acres for each Ranger District.	687
Table 211. Number of archaeological sites and their density on each Ranger District.....	687
Table 212. Number of archaeological sites located in specified elevation bands on each Ranger District.	690
Table 213. Number of archaeological sites located in specified vegetation zone on each Ranger District.	691
Table 214. Number of known archaeological sites within each district that are located on landforms with the specified gradient.	692
Table 215. Proportion of each Ranger District’s holdings with landforms of the specified gradient.....	692
Table 216. Number of known archaeological sites on each Ranger District that are located within the specified distance to a stream.	693
Table 217. Number of known archaeological sites within each Ranger District located on lands with different degrees of agricultural potential.....	693
Table 218. Number of known archaeological sites on each district located on specified landforms.	695
Table 219. Number of known archaeological sites within each district dating to the specified time period where features are either present or absent.	695
Table 220. Number of archaeological site within each Ranger District that date to the specified time period.	696
Table 221. Distribution of areas deemed to contain a high probability of site location across Ranger Districts and the amount of these high probability areas covered by archaeological survey activities.	700
Table 222. Number of archaeological sites on each district with the specified determination of eligibility for inclusion in the National Register of Historic Places.	702
Table 223. Number of sites on each Ranger District exhibiting the specified disturbances during distinct time spans	704

List of Figures

Figure 1. Location of the Gila National Forest.	3
Figure 2. Relationship of the six local scale units within the Gila NF (plan scale); the Forest’s relationship to the context scale area; and the context area’s location within in Arizona and New Mexico	30
Figure 3. Gila NF in relation to the analysis context area, of the White Mountains–San Francisco Peaks–Mogollon Rim (M313A), Sacramento–Manzano Mountains (M313B), and Basin and Range (321A) Ecoregion Sections, and their respective ecoregion subsections in setting within Arizona and New Mexico	32
Figure 4. Gila NF’s local unit subdivisions within the framework of the planning area	35
Figure 5. Gila NF’s opportunity to influence ecosystem sustainability and integrity within the context area landscape.....	37
Figure 6. Spatial niche analysis, potential GNF’s contribution to sustainability of upland ERUs off-Forest within the context area.	38
Figure 7. Gila NF upland ERU spatial niche.	39
Figure 8. Gila NF upland ERU departure from reference condition. The greater the departure the less sustainable the system..	41
Figure 9. Ponderosa pine forest (PPF) ERU	46
Figure 10. General location (in black) of the ponderosa pine forest (PPF) ERU within the context area	47
Figure 11. General location (in black) of the ponderosa pine forest (PPF) ERU within the Gila NF and the six local units.....	47
Figure 12. Variations in seral state departure from reference condition for PPF ERU at the context area, Forest and local unit scales.....	49
Figure 13. Gila NF overstory vegetation successional structural states for ponderosa pine forest (PPF) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities.	50
Figure 14. Mixed conifer-frequent fire forest ERU.....	55
Figure 15. General location (in black) of the mixed conifer-frequent fire forest (MCD) ERU within the context area	56
Figure 16. General location (in black) of the mixed conifer- frequent fire forest (MCD) ERU within the Gila NF and the six local units	57
Figure 17. Variations in seral state departure from reference condition for MCD ERU at the context area, Forest and local unit scales.....	59
Figure 18. Gila NF overstory vegetation successional structural states for dry mixed conifer-frequent fire forest (MCD) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities.	60
Figure 19. Ponderosa pine-evergreen oak forest ERU (Photo by M.R. White 2002).....	64
Figure 20. General location (in black) of the ponderosa pine-evergreen oak forest (PPE) ERU within the context area	65
Figure 21. General location (in black) of the ponderosa pine-evergreen oak forest (PPE) ERU within the Gila NF and the six local units	66
Figure 22. Variations in seral state departure from reference condition for PPE ERU at the context area, Forest and local unit scales.....	68
Figure 23. Gila NF overstory vegetation successional structural states for ponderosa pine-evergreen oak forest (PPE) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities	69
Figure 24. Mixed conifer w/ aspen forest ERU (Wahlberg et al. 2014).....	73
Figure 25. General location (in black) of the mixed conifer w/ aspen forest (MCW) ERU within the context area	74
Figure 26. General location (in black) of the mixed conifer w/ aspen forest (MCW) ERU within the Gila NF and the six local units	75
Figure 27. Variations in seral state departure from reference condition for MCW ERU at the context area, Forest and local unit scales.....	77
Figure 28. Gila NF overstory vegetation successional structural states for mixed conifer with aspen forest (MCW) ERU under reference conditions (RC), current conditions, and following state and transition modeling results at 10 and 100 years, based on current management activities.....	78
Figure 29. Spruce-fir forest ERU (Photo by L.J. WhiteTrifaro 2009).....	82
Figure 30. General location (in black) of the spruce-fir forest (SFF) ERU within the context area.....	83
Figure 31. General location (in black) of the spruce-fir forest (SFF) ERU within the Gila NF and the six local units.....	84
Figure 32. Variations in seral state departure from reference condition for the SFF ERU at the context area, Forest and local unit scales.....	86
Figure 33. Gila NF overstory vegetation successional structural states for spruce-fir forest (SFF) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities	87
Figure 34. Piñon-juniper woodland ERU (Photo by M.R. White 2002).....	91

Figure 35. General location (in black) of the piñon-juniper woodland (PJO) ERU within the context area	92
Figure 36. General location (in black) of the piñon-juniper woodland (PJO) ERU within the Gila NF and the six local units	93
Figure 37. Variations in seral state departure from reference condition for PJO ERU at the context area, Forest and local unit scales.....	95
Figure 38. Gila NF overstory vegetation successional structural states for piñon-juniper woodland (PJO) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities	96
Figure 39. Piñon-juniper grass woodland ERU (Photo by T. Palmer 2006).....	100
Figure 40. General location (in black) of the piñon-juniper grass woodland (PJG) ERU within the context area	101
Figure 41. General location (in black) of the piñon-juniper grass woodland (PJG) ERU within the Gila NF and the six local units	102
Figure 42. Variations in seral state departure from reference condition for PJG ERU at the context area, Forest and local unit scales.....	104
Figure 43. Gila NF overstory vegetation successional structural states for piñon-juniper grass woodland (PJG) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities.....	105
Figure 44. Juniper-grass woodland ERU (Photo by M.R. White 2007)	109
Figure 45. General location (in black) of the juniper grass woodland (JUG) ERU within the context area	110
Figure 46. General location (in black) of the juniper grass woodland (JUG) ERU within the Gila NF and the six local units	111
Figure 47. Variations in seral state departure from reference condition for JUG ERU at the context area, Forest and local unit scale	112
Figure 48. Gila NF overstory vegetation successional structural states for juniper grass woodland (JUG) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities.	114
Figure 49. Madrean piñon-oak woodland ERU (Wahlberg et al. 2014).....	118
Figure 50. General location (in black) of the Madrean piñon-oak woodland (MPO) ERU in the context area	119
Figure 51. General location (in black) of the Madrean piñon-oak woodland (MPO) ERU within the Gila NF and the six local units	120
Figure 52. Variations in seral state departure from reference condition for MPO ERU at the context area, Forest and local unit scales.....	122
Figure 53. Gila NF overstory vegetation successional structural states for Madrean piñon-oak woodland (MPO) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities	123
Figure 54. Piñon-juniper evergreen shrub woodland ERU (Photo by L.J. WhiteTrifaro 2008)	126
Figure 55. General location (in black) of the piñon-juniper evergreen shrub woodland (PJC) ERU within the context area	127
Figure 56. General location (in black) of the piñon-juniper evergreen shrub woodland (PJC) ERU within the Gila NF and the six local units	128
Figure 57. Variations in seral state departure from reference condition for PJC ERU at the context area, Forest and local unit scales.....	130
Figure 58. Gila NF overstory vegetation successional structural states for piñon-juniper evergreen shrub woodland (PJC) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities	131
Figure 59. Mountain mahogany mixed shrubland ERU (Wahlberg et al., 2014).....	135
Figure 60. General location (in black) of the mountain mahogany mixed shrubland (MMS) ERU within the context area	135
Figure 61. General location (in black) of the mountain mahogany mixed shrubland (MMS) ERU within the Gila NF and the six local units	136
Figure 62. Variations in seral state departure from reference condition for MMS ERU at the context area, Forest and local unit scales.....	137
Figure 63. Gila NF overstory vegetation successional structural states for mountain mahogany mixed shrubland (MMS) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities.	138
Figure 64. Montane/subalpine grasslands ERU (Photo by M.R. White 1998).....	141
Figure 65. General location (in black) of the montane/subalpine grasslands (MSG) ERU within the context area	142
Figure 66. General location (in black) of the montane/subalpine grasslands (MSG) ERU within the Gila NF and the six local units	143
Figure 67. Variations in seral state departure from reference condition for MSG ERU at the context area, Forest and local unit scales.....	145

Figure 68. Gila NF overstory vegetation successional structural states for montane/subalpine grasslands (MSG) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities	146
Figure 69. Colorado Plateau/Great Basin grasslands ERU (Wahlberg et al. 2014)	149
Figure 70. General location (in black) of the Colorado Plateau/Great Basin grasslands (CPGB) ERU within the context area	150
Figure 71. General location (in black) of the Colorado Plateau/Great Basin grasslands (CPGB) ERU within the Gila NF and the six local units	151
Figure 72. Variations in seral state departure from reference condition for CPGB ERU at the context area, Forest and local unit scales	152
Figure 73. Gila NF overstory vegetation successional structural states for Colorado Plateau/Great Basin grasslands (CPGB) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities	154
Figure 74. General location (in black) of the semi-desert grassland (SDG) ERU within the context area	158
Figure 75. General location of the semi-desert grassland (SDG) ERU within the Gila NF and the six local units	158
Figure 76. Semi-desert grassland ERU (Photo by M.R. White 2002)	159
Figure 77. Variations in seral state departure from reference condition for SDG ERU at the context area, Forest and local unit scales	161
Figure 78. Gila NF overstory vegetation successional structural states for semi-desert grassland (SDG) ERU under reference conditions (RC), current conditions (CC), and following state and transition modeling results at 10 and 100 years, based on current Forest management activities	162
Figure 79. Seral state departure for each ERU at each scale (context area, Gila NF, local units), and 100-year modeling period results	165
Figure 80. Fire severity at each severity class for each ERU at the Forest scale	170
Figure 81. Biomass carbon stock by ERU in current and reference conditions	175
Figure 82. Trends in Carbon Stocks for Gila NF ERUs	176
Figure 83. Soil organic carbon (tons) for major Gila NF ERUs	181
Figure 84. Average Soil Organic Carbon by ERU	183
Figure 85. Area weighted ecological status departure ratings across the Gila NF's upland ERUs	197
Figure 86. Soil loss departure for Gila NF upland ERUs	200
Figure 87. Current soil condition across the Gila NF's upland ERUs	203
Figure 88. Air quality monitoring sites relevant to the Gila airshed	211
Figure 89. Airsheds and Counties relevant for Gila National Forest	213
Figure 90. Class I and II Areas in New Mexico and Arizona	214
Figure 91. Baseline and projected carbon monoxide emissions	216
Figure 92. Baseline and projected emissions of nitrogen oxides	216
Figure 93. Baseline and projected sulfur dioxide emissions	217
Figure 94. Baseline and projected VOC emissions	217
Figure 95. Baseline and projected coarse particulate matter emissions	218
Figure 96. Baseline and projected fine particulate matter emissions	218
Figure 97. Summary of IMPROVE visibility monitoring data	220
Figure 98. Distribution of haziest days by month	221
Figure 99. Inorganic nitrogen deposition (Gila Cliff Dwellings National Monument, 1985-2012)	222
Figure 100. Sulfur deposition (Gila Cliff Dwellings National Monument, 1985-2012)	223
Figure 101. Five year average of total nitrogen deposition at selected sites	224
Figure 102. Five year average of total sulfur deposition at selected sites	224
Figure 103. Context area subbasins	231
Figure 104. Plan area watersheds	232
Figure 105. Aquatic Biota Indicator	237
Figure 106. Riparian/Wetland Vegetation Indicator	237
Figure 107. Water Quantity Indicator	237
Figure 108. Aquatic Habitat Indicator	237
Figure 109. Water Quality Indicator	238
Figure 110. Soil Condition Indicator	238
Figure 111. Fire Regime/Wildfire Effects Indicator	238
Figure 112. Forest Cover Indicator	238
Figure 113. Roads and Trails Indicator	238
Figure 114. Forest Health Indicator	238
Figure 115. Terrestrial Invasive Species Indicator	238

Figure 116. Rangeland Vegetation Indicator	238
Figure 117. Subbasin watershed conditions on the Gila NF.....	242
Figure 118. Risk to watershed condition across the plan area	244
Figure 119. Representativeness of perennial streams across the plan area.....	252
Figure 120. Redundancy of perennial streams across the plan area	253
Figure 121. Representativeness of intermittent streams across the plan area	254
Figure 122. Redundancy of intermittent streams across the plan area.....	255
Figure 123. Risk to perennial streams across the plan area.....	258
Figure 124. Risk to intermittent streams across the plan area.	259
Figure 125. Location of USGS gages used for streamflow analysis	261
Figure 126. Annual mean and median streamflow at the Mimbres River gage near Mimbres, period of record 1979-2012	263
Figure 127. Monthly flow at the Gila River gage near Gila, period of record 1928-2014	264
Figure 128. Mean monthly streamflow at the San Francisco gage near Glenwood (period of record 1928-2014) and mean monthly precipitation and temperature Southwestern Mountains climate division (period of record 1895-2014)	266
Figure 129. Departure and trend in streamflow for plan area watersheds	268
Figure 130. Water quality departure by plan area watershed.....	295
Figure 131. Representativeness of springs and seeps in plan area watersheds	325
Figure 132. Redundancy of springs and seeps in plan area watersheds	326
Figure 133. Representativeness of non-riverine wetlands in plan area watersheds	327
Figure 134. Redundancy of non-riverine wetlands in plan area watersheds.....	328
Figure 135. Risk to springs and seeps across the plan area.	331
Figure 136. Risk to non-riverine wetlands across the plan area.	332
Figure 137. The Meadows on the Middle Fork of the Gila River, 2011.....	343
Figure 138. The Meadows on the Middle Fork of the Gila River, post-2011	343
Figure 139. Narrowleaf cottonwood/shrub ERU	348
Figure 140. Sycamore-Fremont cottonwood ERU	348
Figure 141. Fremont cottonwood/shrub ERU.....	349
Figure 142. Fremont cottonwood/oak ERU	349
Figure 143. General location of the cottonwood group of riparian ERUs within the context area	350
Figure 144. General location of the cottonwood group of riparian ERUs within the Gila NF and the six local units.....	350
Figure 145. Area-weighted variations in seral state departure from reference condition for cottonwood-willow group at the context area, Forest and local unit scales	353
Figure 146. Plan scale variability in ecological status departure for the cottonwood group and its ERUs	354
Figure 147. Area weighted vegetative groundcover departure.....	355
Figure 148. Arizona alder-willow ERU.....	357
Figure 149. Willow-thinleaf alder ERU.....	357
Figure 150. Ponderosa pine/willow ERU.....	358
Figure 151. Upper montane conifer/willow ERU	358
Figure 152. General location of the montane-conifer willow group of riparian ERUs within the context area.....	359
Figure 153. General location of the montane-conifer willow group of riparian ERUs within the Gila NF and the six local units	359
Figure 154. Area-weighted variations in departure from reference condition for montane-conifer willow group at the context area, Forest and local unit scales	362
Figure 155. Plan area ecological status departure for the montane conifer willow group and its individual ERUs.....	362
Figure 156. Plan area vegetative groundcover departure for the montane-conifer willow group and its individual ERUs.....	363
Figure 157. Herbaceous Riparian ERU.....	365
Figure 158. General location of Herbaceous riparian ERU within the context area	366
Figure 159. General location of Herbaceous-wetland riparian within the Gila NF and the six local units.....	366
Figure 160. Variations in departure from reference condition for wetland (ciénega) group at the context area, Forest and local unit scales.....	368
Figure 161. Arizona walnut ERU.....	370
Figure 162. General location of the walnut-evergreen tree group of riparian ERUs within the context area	371
Figure 163. General location of the walnut-evergreen tree group of riparian ERUs within the Gila NF and the six local units ...	371
Figure 164. Area-weighted variations in seral state departure from reference condition for walnut-evergreen tree group at the context area, Forest and local unit scales	373
Figure 165. Desert willow ERU.....	374
Figure 166. General location of the desert willow ERU within the context area	375
Figure 167. General location of the desert willow riparian ERU within the Gila NF and the six local units	375

Figure 168. Area-weighted variations in departure from reference condition for desert willow group at the context area, Forest and local unit scales	377
Figure 169. Average annual precipitation in inches, 30 year normals, time period 1981-2000.	443
Figure 170. Climate Divisions of the Gila NF	446
Figure 171. Average annual temperature for the New Mexico Southwestern Mountains and Southern Desert climate divisions, 1895-2014 time periods	446
Figure 172. Average annual precipitation for the New Mexico Southwestern Mountains and Southern Desert climate divisions, 1895-2014 time periods	447
Figure 173. Reconstructed cool season precipitation for the Southwestern Mountains climate division.....	448
Figure 174. Reconstructed cool season precipitation for the Southern Desert climate division	448
Figure 175. Drought cycles as depicted by the climate division PDSI values, period of record 1896- 2014	450
Figure 176. Climate change vulnerability categories by watershed	453
Figure 177. Gila National Forest Area of influence for the social, cultural, and economic analysis.....	481
Figure 178. Percentage change in each New Mexico county population between 2000 and 2010.	483
Figure 179. Historical and projected population of Gila NF area of influence counties.	484
Figure 180. Net migration to/from Gila NF area of influence counties.	485
Figure 181. Historical and projected age distribution in Gila NF area of influence.....	486
Figure 182. Unemployment rate in Gila NF Counties (1990-2010).	489
Figure 183. Household income distribution in the area of influence.....	492
Figure 184. Vacant seasonal/recreational homes in the area of influence counties, by county	494
Figure 185. Quantity and Value of Forest Fuelwood Permits, 2005-2012.	507
Figure 186. Gila National Forest gross receipts by source, 2001-2014	509
Figure 187. Permitted and authorized livestock head months (HM) on the Gila National Forest 2005-2015. Source: USFS Gila NF 2016b	523
Figure 188. Draft Gila NF ROS Inventory 2016	544
Figure 189. Gila NF Annual Visitation Numbers between 2006 and 2011	546
Figure 190. Gila NF Average Duration (hours) of Visit by Site Type between 2006 and 2011	547
Figure 191. Percent of Visitation by Distance Traveled between 2006 and 2011	549
Figure 192. Gila N.F. Percent of Visitation by Age	550
Figure 193. Map of light pollution in the region surrounding the Gila National Forest	558
Figure 194. Major access routes in and around the Gila National Forest	562
Figure 195. Major bodies of water on the Gila National Forest.....	564
Figure 196. San Francisco Box Landform	568
Figure 197. Map of areas that are natural appearing based on wilderness and inventoried roadless areas	569
Figure 198. Effects from the Silver Wildfire of 2013 seen from Emory Pass Vista	571
Figure 199. Effects from the 2006 Bear Fire	572
Figure 200. Thinning and Mastication around Poverty Creek.....	573
Figure 201. Prescribed Fire at Indian Peaks	574
Figure 202. Quemado Lake Recreation Area	575
Figure 203. Campsite in the Mesa Campground blending into the surrounding landscape	575
Figure 204. Powerline Utility Corridor in the Foreground Distance Zone	576
Figure 205. Wilderness and Wilderness Study Areas, Gila National Forest	583
Figure 206. Fires 1,000+ acres within the Gila Wilderness 2005 – 2015.....	587
Figure 207. Fires 1,000+ acres within the Aldo Leopold Wilderness 2005 – 2015	590
Figure 208. Forest Service and BLM Wilderness Study Areas	592
Figure 209. Inventoried Roadless Areas, Gila National Forest	595
Figure 210. Eligible Wild and Scenic Rivers and Research Natural Areas, Gila National Forest	599
Figure 211. National scenic byways through the Gila NF.....	603
Figure 212. Map of the National Scenic Trail and National Recreation Trails on the Gila NF	604
Figure 213. Major access routes in and around the Gila National Forest	617
Figure 214. “State Line Agreement” areas administered by the adjacent National Forest along the NM/AZ boundary	630
Figure 215. Proclaimed Gila and Apache National Forests that are administered by the Gila National Forest along with the current District Boundaries	631
Figure 216. Other Federal lands administered by the Gila National Forest near part of the former Fort Bayard	632
Figure 217. Wilderness Areas and Wilderness Study Areas on the Gila National Forest.....	634
Figure 218. Mining districts in southwestern New Mexico with significant metal deposits.	649
Figure 219. Geothermal favorability in southwestern New Mexico.	653
Figure 220. Major energy transmission lines intersecting the Gila National Forest.	655

Figure 221. Currently producing oil and gas basins in New Mexico.....	656
Figure 222. Coal fields in southwestern New Mexico.....	657
Figure 223. Probability of an earthquake measured over 5.0 magnitude in southwest New Mexico over the next 20 years	658
Figure 224. Depiction of routes followed by Fray Marcos and Coronado and later entradas along the Camino Real.	674
Figure 225. Location of Spanish and Mexican land grants adjacent to the Plan Area	677
Figure 226. Depiction of areas where archaeological survey has been conducted in the Plan Area	688
Figure 227. Location of known archaeological sites present within the Gila National Forest.	689
Figure 228. Location of some areas determined to have a high probability of site location.	699
Figure 229. Location of archaeological sites within the Plan Area that are listed in the NRHP.	701
Figure 230. Precipitation reconstruction for A.D. 650-1950 depicting dry and moist periods.	708
Figure 231. Stream channel dynamics for Colorado Plateau and Middle Gila River areas and possible stream channel dynamics for Plan Area based on yearly precipitation reconstruction.	710
Figure 232. Location of the Gila National Forest (plan area) in relationship to consulting tribes.....	716
Figure 233. The Zuni Cultural Resource Advisory Team visiting a rock art site on the Gila National Forest.....	720

List of Commonly Used Acronyms

AAW	Arizona Alder-Willow (ecological response unit)
ACHP	Advisory Council on Historic Preservation
AML	appropriate management level
AOI	annual operation instructions
AP	Apache (local zone)
ARPA	Archaeological Resource Protection Act
ATV	all-terrain vehicles
BASI	best available scientific information
BBER	Bureau of Business and Economic Research
BISON	Biota Information System of New Mexico
BLM	Bureau of Land Management
BMP	best management practice
BR	Black Range (local zone)
CAA	Clean Air Act
CCC	Civilian Conservation Corps
CCF	hundred cubic feet
CCVA	Climate Change Vulnerability Assessment
CDNST	Continental Divide National Scenic Trail
CDT	Continental Divide Trail
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CEQ	Council on Environmental Quality
CFF	cubic Feet
CFR	Code of Federal Regulations
CFRP	Collaborative Forest Restoration Program
CO	carbon monoxide
CPCC	Comprehensive Plan for Colfax County
CPGB	Colorado Plateau-Great Basin Grassland (ecological response unit)
CPM	coarse particulate matter
CS	context scale
CSP	concentrating solar power
CWCS	Comprehensive Wildlife Conservation Strategy
CWD	coarse woody debris
CWPP	County Wildfire Protection Plan
DEIS	draft environmental impact statement
DI	distribution index
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
DW	Desert Willow (ecological response unit)
EA	environmental assessment
EIS	environmental impact statement
EO	Executive Order
EPA	Environmental Protection Agency
ERU	ecological response unit
ESA	Endangered Species Act
FAR	Functioning at Risk
FCI	facility condition index
FCO	Fremont Cottonwood-Oak (ecological response unit)

FCS	Fremont Cottonwood-Shrub (ecological response unit)
FEIS	final environmental impact statement
FIA	Forest Inventory and Analysis
FIDO	Forest Inventory Data Online
FOIA	Freedom of Information Act
FP	Functioning Properly
FPM	fine particulate matter
FRCC	fire regime condition class
FRI	fire rotation interval
FSH	Forest Service Handbook
FSM	Forest Service Manual
FVS	Forest Vegetation Simulator
FWS	Fish Wildlife Service
FY	fiscal year
GCM	Global Circulation Model
GIS	geographical information system
GMU	game management unit
GNF	Gila National Forest
HBI	Hilsenhoff Biotic Index
HM	head month
HUC	Hydrologic Unit Code
IBA	Important Bird Area
IF	Impaired Function
ILAP	Integrated Lands Assessment Project
IMPROVE	Interagency Monitoring of Protected Visual Environments
IRA	inventoried roadless area
JUG	Juniper-Grass (ecological response unit)
Kg/ha	kilograms per hectare
LAR	Land Area of the National Forest System Report
LCSAF	Little Colorado-San Agustin Fringe (local zone)
LG	Lower Gila (local zone)
LS	local scale
LSRS	Land Status Records System
MBGR	motorized big game retrieval
MCD	Mixed Conifer-Frequent Fire (ecological response unit)
MDC	motorized dispersed camping
MCW	Mixed Conifer with Aspen (ecological response unit)
MDN	Mercury Deposition Network
MF	Mogollon Front (local zone)
MIS	management indicator species
ML	maintenance level
MMCF	million cubic feet
MMS	Mountain Mahogany Mixed Shrubland (ecological response unit)
MOU	memorandum of understanding
MPO	Madrean Piñon-Oak (ecological response unit)
MSG	Montane Subalpine Grassland (ecological response unit)
MTBS	monitoring trends in burn severity records
MVUM	motor vehicle use map
NAAQS	national ambient air quality standards

NADP	National Atmospheric Deposition Program
NAGPRA	Native American Graves Protection Act
NCS	Narrowleaf Cottonwood-Shrub (ecological response unit)
n.d.	no date
NEI	National Emission Inventory
NEPA	National Environmental Policy Act
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest System
NFSR	National Forest System road
NFST	National Forest System trail
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NM	New Mexico
NMAAQS	New Mexico ambient air quality standards
NMBCC	New Mexico Biodiversity Collection Consortium
NMCHAT	New Mexico Crucial Habitat Assessment Tool
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NMED-AQB	New Mexico Environment Department, Air Quality Bureau
NMOCD	New Mexico Oil Conservation Division
NMOSE	New Mexico Office of the State Engineer
NMRPTC	New Mexico Rare Plants Technical Council
NO	nitrogen dioxide
NOA	notice of availability
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRHP	National Register of Historic Places
NRV	natural range of variation
NTN	National Trends Network
NVUM	national visitor use monitoring
NWI	National Wetland Inventory
O	ozone
OHV	off-highway vehicle
OML	operational maintenance level
ONRW	outstanding natural resource water
ORV	off-road vehicle
Pb	lead
PFC	proper functioning condition
PHA	priority heritage asset
PILT	payment in lieu of taxes
P.L.	Public Law
PJC	Piñon-Juniper-Evergreen Shrub (ecological response unit)
PJG	Piñon-Juniper Grass (ecological response unit)
PJO	Piñon-Juniper Woodland (ecological response unit)
PM	particulate matter
PNC	potential natural community
PPE	Ponderosa Pine-Evergreen (ecological response unit)
PPF	Ponderosa Pine Forest (ecological response unit)

PPW	Ponderosa Pine-Willow (ecological response unit)
PS	plan scale
PSD	Prevention of Significant Deterioration
PV	photovoltaic
RAD	Risk Assessment Database
RASES	Riparian Area Survey and Evaluation System
RD	Ranger District
RGCT	Rio Grande cutthroat trout
RHR	Regional Haze Rule
RMAP	Riparian Map
RMP	Resource Management Plan (Bureau of Land Management document)
RNA	research natural area
ROD	record of decision
ROS	Recreation Opportunity Spectrum
SCC	species of conservation concern
SCS	Soil Conservation Service
SDG	Semi-desert Grassland (ecological response unit)
SEINet	Southwest Environmental Information Network
SFC	Sycamore-Fremont Cottonwood (ecological response unit)
SFF	Spruce-Fir Forest (ecological response unit)
SHPO	State Historic Preservation Office
SIP	state implementation plan
SMS	Scenic Management System
SO2	sulfur dioxide
SRS	Secure Rural Schools
SYFMA	Sustained Yield Forest Management Act
TAP	travel analysis process
TCP	traditional cultural properties
TES	Terrestrial Ecosystem Survey
TEU	terrestrial ecosystem unit
TMR	Travel Management Rule
UG	Upper Gila (local zone)
UMCW	Upper Montane Conifer-Willow (riparian ecological response unit)
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	US Geological Survey
UTV	utility terrain vehicle
VDDT	Vegetation Dynamics Development Tool
VOC	volatile organic compounds
VQO	visual quality objective
WPA	Works Program Administration
WQCC	Water Quality Control Commission
WRAP	Western Regional Air Partnership
WRAPTSS	Western Regional Air Partnership Technical Support System
WSA	wilderness study area
WTA	Willow-Thinleaf Alder (riparian ecological response unit)
WUI	wildland-urban interface
YCC	Youth Conservation Corps

Introduction to the Assessment

Purpose

The Gila National Forest is in the process of revising a land and resource management plan that has been in place since 1986. The 2012 Planning Rule (36 CFR 219) provides the framework to create local land management plans for national forests and grasslands across the nation. The rule establishes an ongoing, three-phase process: 1) assessment; 2) plan development or revision; and 3) implementation and monitoring.

The 2012 Planning Rule is intended to create a plan that guides resource management on the Gila National Forest within the context of the broader landscape. It takes an integrated and holistic approach that recognizes the interdependence of ecological, social, cultural and economic systems. Collaboration with stakeholders and process transparency are key components of this approach.

This document represents the assessment phase of the process. It is designed to rapidly evaluate information about ecological, economic and social conditions, trends, and sustainability relative to the 15 assessment topics listed in 36 CFR 219.6(b), and their relationships to the current land management plan. The approach uses the best available scientific information and local knowledge to inform the process. This assessment report is not a decision making document, but provides current information on assessment topics. The conditions and trends found in the assessment report will help to identify the current Forest Plan's need for change, and aid in the development of the revised plan. The revised Gila National Forest's Land and Resource Management Plan, also known as the Forest Plan, will consider a full range of multiple uses.

Throughout this document, the Gila National Forest is referred to as "Gila NF", the "Forest", or the "plan area". The Gila National Forest Land and Resource Management Plan (USDA FS Gila NF 1986) is referred to as the "Gila NF Plan" or "Forest Plan".

This introductory chapter includes an Ecosystem Services Framework section that describes how the ecological, social, cultural and economic assessments are interrelated and dependent on one another to provide for multiple use and sustained yield. An explanation of what is considered to be the best available scientific information follows. The Public Participation and Tribal Engagement sections describe the variety of ways the Gila NF has interacted with tribes and stakeholders in the early stages of the forest plan revision process. The Consideration of Existing Plans section identifies governmental or non-governmental land and resource management plans containing information relevant to the Gila NF Plan assessment and revision.

The Setting and Distinctive Features describes the physical characteristics and setting of the Forest, and its place within the broader landscape.

Section I. Ecological Integrity and Sustainability examines the conditions, trends and risks to integrity and sustainability for the five ecological resource areas identified in the 2012 Planning Rule (36 CFR 219.6(b)). Within this section, an ecological assessment of upland vegetation, soils, carbon, air, water, riparian, aquatic and at-risk species is conducted to understand current conditions and trends. These assessments conclude with an evaluation of risk for loss of integrity and sustainability which forms the basis for determining whether or not there is a need for change in the current Forest Plan to change management direction.

Section II. Social, Economic and Cultural Sustainability assesses conditions, trends and risks to sustainability for the ten social, cultural and economic based topic areas identified in the 2012 Planning Rule (36 CFR 219.6(b)). It assesses the goods and services obtained from the Gila NF which provide social, economic and cultural benefits to people and communities. It considers the current condition of the goods and/or services, drivers or stressors affecting demand or availability, the current ecological condition and trend of the resource(s) providing the goods and/or services, and the relationship between on and off Forest conditions. Each chapter concludes by identifying issues of concern, or risks that may prevent the sustainability of the goods and/or service, which forms the basis for determining whether or not there is a need for change in the current Forest Plan to change management direction.

Ecological integrity and sustainability on the Gila NF, and the Forest's ability to contribute to social, cultural and economic conditions are intricately connected and interdependent. Because of this connection and interdependence, there is considerable cross-referencing between chapters. References can be found toward the end of the report.

Forest Setting and Distinctive Features

The Gila NF lies in southern Catron, northern Grant, western Sierra and extreme northeastern Hidalgo counties in southwestern New Mexico. It was established in 1899 and covers approximately 3.3 million acres of public land, making it the sixth largest National Forest in the continental United State. Twenty four percent of the Forest area is composed of the Gila, Aldo Leopold and Blue Range Wildernesses. The Gila Wilderness was administratively established in 1924 by the U.S. federal government as the first designated wilderness. The Aldo and Blue Range Wildernesses were later established in 1980. The Forest Supervisor's office is located in Silver City, New Mexico with six ranger district offices in Glenwood, Mimbres, Quemado, Reserve, Silver City and Truth or Consequences. Figure 1 provides a vicinity map.

The Forest has 12 mountain ranges and an elevational range of 4,160 to 10,770 feet. Annual precipitation ranges from approximately 11 inches on the northern end of the Forest near Quemado and on the very southern end of the Black Range to over 35 inches in the higher elevations of the Black Range and Mogollon Mountains. The Forest includes semi-desert grasslands and shrublands, woodlands, ponderosa pine, mixed conifer and spruce-fir life zones. Major streams include the Mimbres River, the Gila River and its tributary the San Francisco River.

The Forest provides habitat for elk, deer, pronghorn, bighorn sheep, javelina, coatimundi, turkey, bear and mountain lion and many other wildlife species. Habitats across the Forest also support many endangered, threatened or candidate species such as Gila trout, spikedace, loach minnow, Chiricahua leopard frog, southwestern willow flycatcher, Mexican gray wolf, Mexican spotted owl and others.

The Forest has a rich cultural history with archaeological resources reflecting a 13,000 year occupational time period. At present, the Catron, Grant, Hidalgo and Sierra Counties are home to just over 50,000 people, who rely on the Forest to varying degrees as a source of sustenance. This has manifested through

various means ranging from utilizing the natural resources on the Forest for livelihood; creating community synergy around issues and events; offering a place for groups to commune, work, and recreate together; to providing solitude, peace, and relaxation for individuals who want to get away from the social pressures and pace of their everyday world. While ways and means may have changed over time, people enjoy all manner of activities on the Forest. Firewood gathering is an important traditional activity as many local residents still rely on wood to heat their homes during the cold winter months. Permitted livestock grazing, hunting and outfitting and guiding are also long-standing traditions. The Forest also provides outdoor recreational activities for both area residents and tourists. Forest management continues to bring communities together over issues that affect them or to foster involvement through volunteer work on their favorite part of the Forest. All of these uses help maintain social cultures and longstanding traditions.

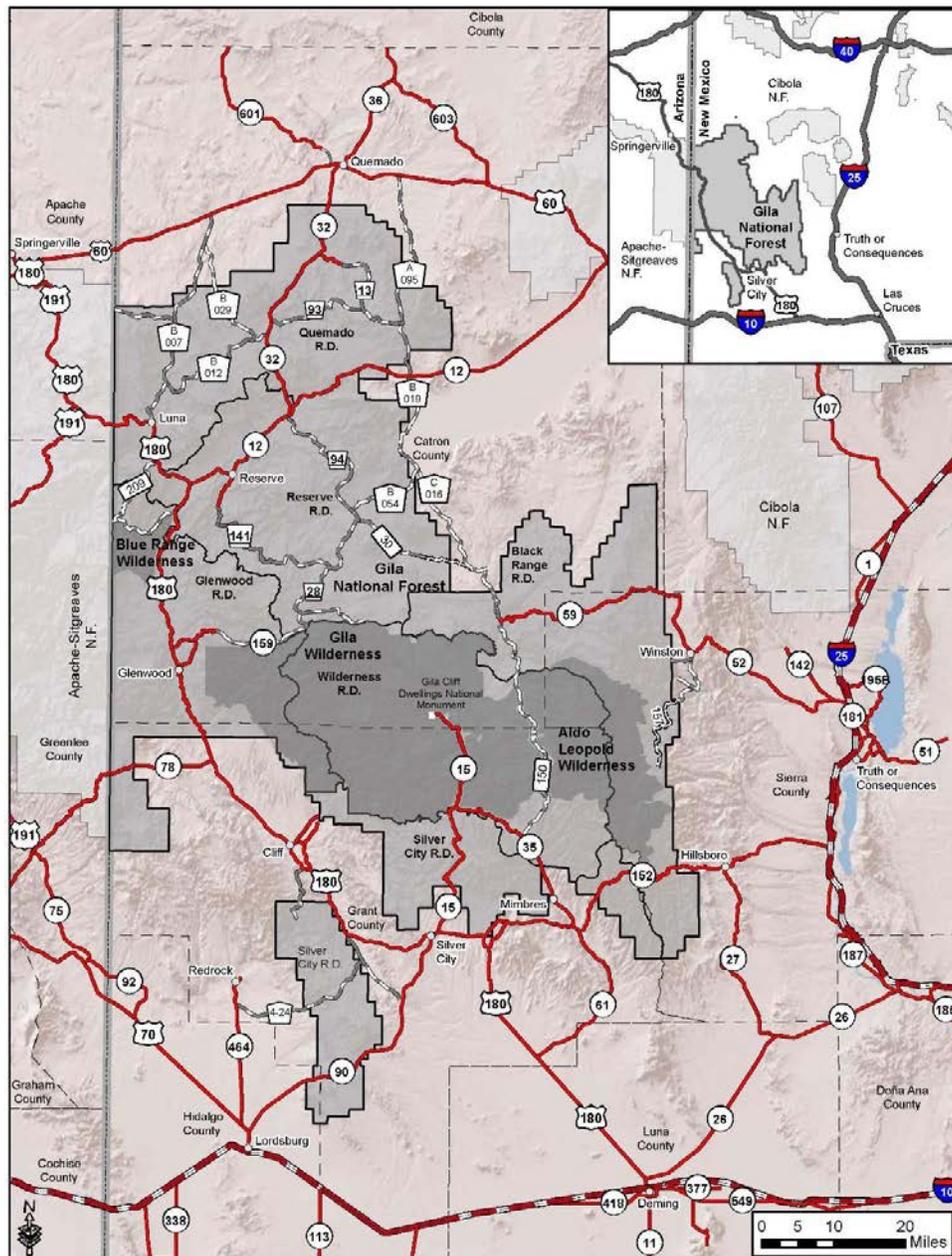


Figure 1. Location of the Gila National Forest.

Ecosystem Services Framework

Ecosystem services are a product of functioning ecosystems that affect social, cultural and economic conditions. They are the goods and services that people enjoy or benefit from, including but not limited to scenic views, fish and wildlife, recreation opportunities, food, forage, fiber, fuel, energy, clean water, timber, carbon storage, flood control, and disease regulation. The Millennium Ecosystem Assessment (MEA 2005) has served as the motivation for applying the ecosystem services concept to national forest and grassland management. Ecosystem services are grouped into four broad categories:

- Supporting ecosystem services are those that are necessary for the production of other ecosystem services, such as pollination, seed dispersal, soil formation and nutrient cycling.
- Regulating ecosystem services are the benefits people obtain from the regulation of ecosystem processes. Climate regulation, water filtration and purification, soil stabilization, flood control, and disease regulation are a few examples.
- Provisioning ecosystem services are the products people obtain from ecosystems, such as clean air, fresh water, energy, food, fuel, forage, wood products and minerals.
- Cultural ecosystem services are the nonmaterial benefits people obtain from ecosystems such as educational, aesthetic, spiritual and cultural heritage values, and recreational experiences.

Management of the ecological systems on the Gila NF will influence its ability to support some ecosystem services. For example, a regulating service such as flood control, can have important consequences both within and beyond the plan area. Ecosystem services that are important within the broader landscape and are likely to be influenced by the land management plan are the focus of the assessment and ultimately, plan revision (FSH 1909.12, Chap. 10, Sec. 13.12). Use of the ecosystem services concept and analysis of ecosystem services are integrated throughout the assessment.

Best Available Scientific Information

The assessment is based on the best available scientific information (BASI) that has been determined to be accurate¹, reliable² and relevant³ to the issues being considered (FSH 1909.12, Chap. 0, Sec. 07). The

¹ To be accurate, the scientific information must estimate, identify or describe the true condition of its subject matter. This description of the true conditions may be a measurement of specific conditions, a description of operating behaviors (physical, biological, social or economic), or an estimation of trends. Statistically accurate information is near to the true value of its subject, quantitatively unbiased and free of error in its methods. The extent to which scientific information is accurate depends on the relationship of the scientific findings to supportable evidence that identifies the relative accuracy or uncertainty of those findings. The accuracy of scientific information can be more easily evaluated if reliable statistical or other scientific methods have been used to establish the accuracy or uncertainty of any findings relevant to the planning process.

² Reliability reflects how appropriately the scientific methods have been applied and how consistent the resulting information is with established scientific principles. The scientific information is more reliable if it results from an appropriate study design and well-developed scientific methods are clearly described. The assumptions, analytical techniques, and conclusions are well referenced with citations to relevant, credible literature and other pertinent existing information. Conclusions are based on reasonable assumptions that are supported by other studies and are consistent with the general theory underlying those assumptions or are logically and reasonably derived from the data presented. Any gaps in information and inconsistencies with other pertinent scientific information are adequately explained. Scientific information that describes statistical or other scientific methods used to determine both its accuracy and uncertainty can be considered more reliable. The use of quantitative analysis that has a known (and quantifiable) rates of errors and results improves this reliability. An accuracy assessment of the data supports the reliability of the quantitative analysis. The application of quality control to scientific information also improves the reliability of the information. One form of quality control is peer review. Peer review is a critical review by qualified scientific experts in that discipline that is then addressed by the proponents of the information. Publication in a refereed scientific journal usually indicates that the information has been appropriately peer reviewed.

³ The information must pertain to the issues under consideration at spatial and temporal scales appropriate to the plan area and to a land management plan. Relevance in the assessment phase is scientific information that pertains to conditions and trends about the 15 topics in 36 CFR 219(b) or to the sustainability of social, economic, or ecological systems (36 CFR 219.5(a)(1)).

Gila NF has provided opportunities for public and governmental participation, inviting submission of information, including scientific information that may be relevant to the planning process. The information determined to constitute the BASI is identified throughout this document. How it informed the assessment is discussed as each issue is being considered. The BASI is not always a single source of scientific information that is “best” for a specific subject. When scientific consensus does not exist, the BASI may be from multiple sources and may recognize conflicting information (FSH 1909.12, Chap. 0, Sec. 07.12). Contradictory BASI is described where it exists.

Among the scientific information that may be considered the BASI are:

- Peer reviewed articles
- Scientific inventories, observational data and assessments
- Expert opinion
- Panel consensus
- Data prepared and managed by the Forest Service or other federal agencies which may include information in spatially referenced databases and various types of statistical or observational data.
- Scientific information prepared by universities, national networks and other reputable scientific organizations
- Data or information from public and governmental participation (FSH 1909.12, Chap. 0, Sec. 07.13)

Public Participation

Public participation in the planning process began prior to the May 2015 publication of a Public Notice in the Federal Register that marked the official start of the assessment. Briefings were provided to Catron, Grant, Hidalgo and Sierra County Commissions in 2015. A series of community conversations were held in March 2015 at Quemado, Reserve, Glenwood, Silver City, Mimbres and Truth or Consequences. The desired outcomes of these conversations were to introduce forest plan revision, identify expectations, opportunities and methods for communication and engagement, and build or enhance relationships between the Gila NF and its stakeholders. A Gila NF representative also attended a public meeting hosted by the Lincoln National Forest in Las Cruces in March 2015.

These initial conversations were facilitated by the National Collaboration Cadre. The Cadre is a network of people from around the United States who provide coaching and training assistance to national forests and their communities who are interested in understanding, developing and improving collaborative processes. Cadre members’ experience range from Forest Service staff in all types of positions; local municipal and county government, both elected and staff; non-profit regional associations; to academics and project consultants. All members have worked for and/or with the Forest Service at varying points in their careers and from different perspectives.

Participants shared ideas, concerns, facts and dates related to the Gila NF that were significant to their communities and important for the Gila NF staff to be aware of through an exercise known as the Generations Wall. This exercise helped create an open dialog and provided the Gila NF staff a better understanding of local perspectives on national, regional and local Forest Service management history, values, current conditions, trends, threats and future desired conditions as they relate to the Gila NF and its communities. Expectations related to communication and engagement in the revision process were discussed in small groups including the expectations participants have of the Gila NF, expectations the Gila

Relevance in the planning phase is information pertinent to the plan area or issues being considered for the development of plan components or other plan content (FSH 1909.12, Chap. 0, Sec. 07.12).

NF has of stakeholders, and the expectations stakeholders have of each other. Participants were asked to identify the best ways to engage them and their communities in the plan revision process and the preferred methods of sharing information and keeping people informed. They were also asked to identify any individuals or groups that were not in attendance or not represented and how those connections might be made. The information shared during these meetings were used to develop the Forest's Public Participation Strategy. The [Public Participation Strategy](#) and [summaries](#) of these conversations are available on the Gila NF's Plan Revision webpage at <http://go.usa.gov/h88k>.

Since March 2015, the Gila NF has presented on plan revision at 28 governmental and organizational meetings at the request of those self-convening groups. Informational booths at 10 special events such as county fairs have been an ongoing way to share materials summarizing the plan revision process. On-line and interactive classroom sessions to engage Grant County youth and educators were conducted by Dr. Kathy Whiteman of Western New Mexico University. Input gathered from this work revealed that existing designated areas, at-risk species, air, soil, water, ecosystems and ecosystem processes were considered the most important assessment topics. Fire damage, poor trail maintenance, human impact, and off-road vehicle use were areas of concern. Education, public involvement and partnerships were identified as opportunities to promote the best possible future outcomes of plan revision. Whiteman's report is included as Appendix F to the [Assessment Input](#) document on the Gila NF's Plan Revision webpage.

Another round of public meetings at the same locations was held in August 2015 to gather input for the assessment phase of plan revision. These meetings were facilitated by Karen Yori from Blue Earth Ecological Consultants, Inc. based in Santa Fe, NM. Participants were provided an overview of the assessment process, including the 15 topics identified in the 2012 Planning Rule and were asked two questions:

- 1) For the assessment topics that are most important to you, what current conditions and trends have you seen on the Gila?
- 2) What are your concerns associated with the conditions and trends you mentioned, and what may be some of the opportunities in those areas?

Opportunities were also provided for stakeholders to share knowledge, plans, and data for the assessment. These meeting materials and questions also went out in emails or written letters to stakeholders on the Gila NF's plan revision contact list that were not able to attend any of the meetings. The input gathered at these meetings and received via email or written response is available on the Gila NF's Plan Revision webpage in the document titled "[Assessment Input](#)" (USDA FS Gila NF 2015a). It is also used in the development of parts of the ecological, and social, cultural and economic sections of the assessment including a section devoted to stakeholder input in most chapters. These summaries build on the March 2015 conversations, describing how stakeholders value and use the Forest, how they understand Forest Service management and how they see the Gila NF of the future. Where there is broad agreement between stakeholder perspectives and assessment findings, there is confidence in moving forward. Whereas disagreement between stakeholder perspectives and assessment findings indicate potential opportunities for additional dialogue.

In February 2016, the Gila NF and the Southwestern Regional Office participated in the 6th Natural History of the Gila Symposium hosted by Western New Mexico University. A notice and invitation were sent out to the entire Forest plan revision contact list. Ecological assessment data and analysis approaches were presented, including: an overview of forest plan revision, the analysis framework, state and transition modeling, vegetation, soil, water, at-risk species and a history of insects and disease.

The Forest expects to release the draft assessment report to the public and other stakeholders for feedback in 2016, after which the next round of community meetings are planned. These meetings will focus on discussing key findings from the assessment and developing needs for change statements for the 1986 Forest Plan.

Tribal Engagement

The Gila National Forest maintains a governmental relationship with ten federally recognized Indian tribes, also directly contacting specific bands within those tribes that live nearby. All of these groups have been contacted by mail and by phone in regards to Forest Plan Revision. Face-to-face consultation has occurred with four tribes so far during the assessment phase. We hope that as the Forest Plan Revision process progresses that we will have substantive conversations with all ten tribes, developing a growing understanding of their vision of how we can best partner with them and how this landscape should best be managed into the future.

Topics of conversation with tribes during this phase covered a range of topics. Tribes discussed concerns about climate change, the importance of forest restoration, and an appreciation of recent travel management efforts, which hopefully reduce resource degradation and habitat fragmentation. There was some discussion of hunting and gathering on-Forest. Cultural resource management issues discussed included: research interests and concerns, and opportunities for tribal involvement in interpretation of cultural sites for Forest visitors. Another major topic was opportunities for tribal youth to be exposed to the traditional lands that are now part of the Gila National Forest, either through educational activities (on the ground or virtual), through working with other researchers, or as employees. Other Forests have solicited the tribes regarding their concerns and interests in forest management; comments they have received have reflected similar concerns and interests. Specific comments have been received by other Forests about concerns over increased development, impacts to resources from off-road travel, the environmental and cultural impacts of mining, chemical treatments of native plants, and protection of agave. We anticipate continued tribal involvement throughout the plan revision process and anticipate that the revised plan will emphasize mutually beneficial relationships between the Forest and Tribes.

Consideration of Existing Plans

The Gila NF will consider relevant, existing plans when developing the revised plan to look for opportunities to increase compatibility and reduce conflict. Plans and plan assessments identified for consideration include, but are not limited to:

- Catron, Grant, Hidalgo and Sierra County Master Plans
- Cities of Lordsburg, Truth or Consequences, and Town of Silver City Comprehensive Plans
- New Mexico Department of Game and Fish Comprehensive Wildlife Conservation Strategy
- New Mexico Draft State Wildlife Action Plan
- New Mexico Statewide Fisheries Management Plan
- U.S. Fish and Wildlife Service Recovery Plans
- New Mexico State Implementation Plan (Air Quality)
- New Mexico Forest and Watershed Health Plan
- New Mexico Statewide Natural Resources Assessment & Strategy and Response Plan
- Socorro-Sierra and Southwest New Mexico Regional Water Plans
- New Mexico State Water Plan
- New Mexico Statewide Water Quality Management Plan and Nonpoint Source Management Plan
- Soil and Water Conservation District Plans

- Bureau of Land Management Resource Management Plans
- Community Wildfire Protection Plans
- New Mexico Statewide Outdoor Recreation Plan
- Silver City Greenways Trail Master Plan
- New Mexico Department of Transportation Long Range Transportation Plan
- Other National Forests' Land and Resource Management Plans and Plan Revisions