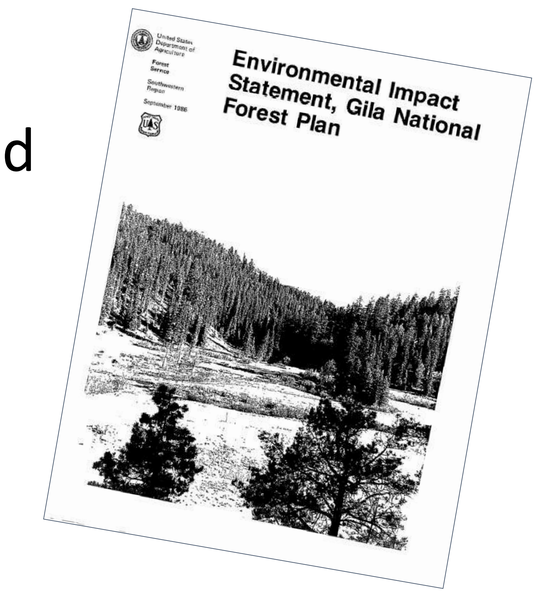
Forest Plan Revision Overview

The Forest Plan is the comprehensive document guiding management for all resources on the National Forest for the next 15 years or more

An opportunity for your knowledge and suggestions to be heard and shape the Forest's future management

Policy requires that forest plans be revised periodically. The Forest and surrounding areas have experienced significant changes since 1986 when the existing plan was approved.

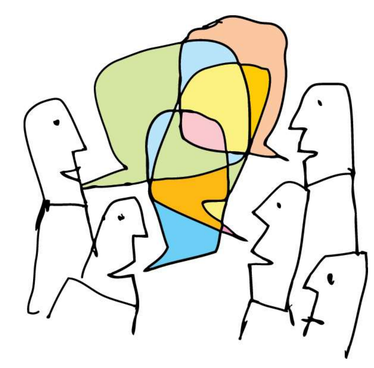


THREE PHASES

1. Assessment (1.5 years)
2. Plan Revision (~3 years)
3. Implementation and Monitoring (15+ years)

How can you help? Be an active stakeholder in developing a future vision for the forest

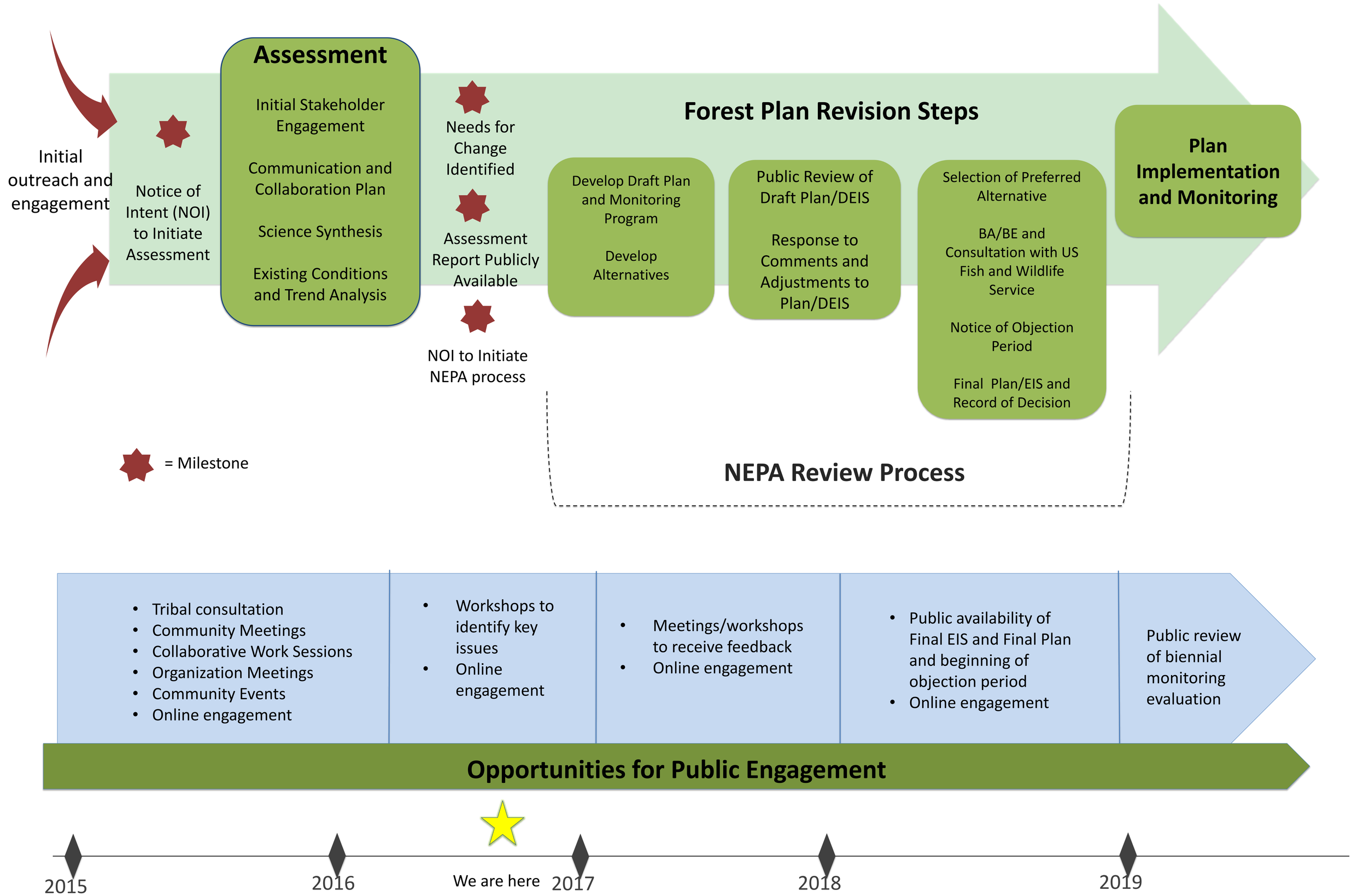
Your input will help develop plan direction that will provide for a healthy, diverse, and productive Forest in addition to the many benefits and uses desired by local communities and visitors of today and future generations.



For more information, please visit our website http://go.usa.gov/h88k

Gila National Forest - Forest Plan Revision Road Map

Dates are anticipated and subject to change

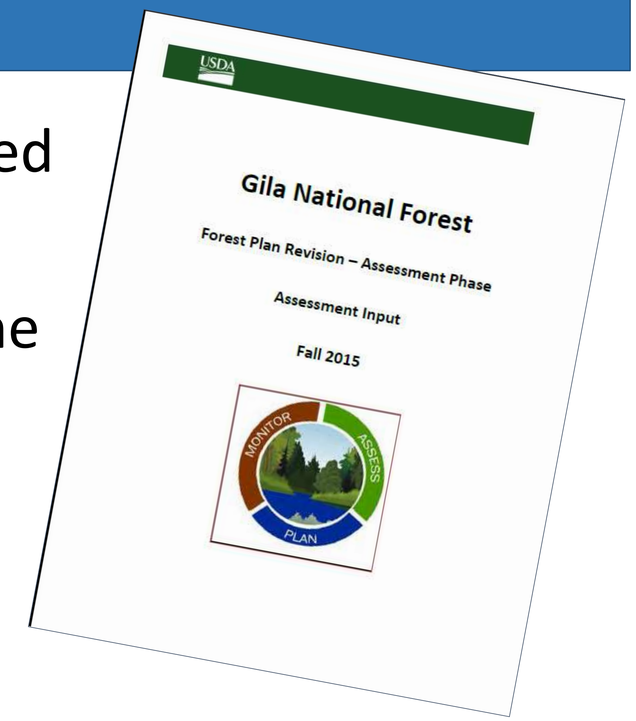


What is the assessment?

- Evaluates existing information about ecological, social, and economic conditions, trends, and any risks to sustainability.
- Uses the best available science, local information, national perspectives, and native knowledge.
- Helps everyone understand both existing and predicted future conditions.
- Recently released the draft assessment report for feedback.
- Report includes your input from earlier meetings.
- Your feedback is most useful if submitted before November 15
- Meeting posters capture some of the highlights of the assessment report.
- The trends and conditions identified in the assessment will help determine the current plan's need for change and aid in the development of the revised plan.

Assessment Community meeting in Truth or Consequences

What **we heard from you…**
Assessment Input



- From the community meetings and web-based outreach, we received over 200 pages of assessment input
- Helped make the draft assessment report more representative of the land, people, and uses and culture of the area
- Input incorporated throughout the draft assessment report
- Each chapter has a section on stakeholder input received

Assessment Community meeting in Reserve

<u>Examples of your input from previous community meetings:</u>

"Grasslands are in poor condition. Cooperative effort to restore grassland (agencies & land owners) will benefit cows and grazing wildlife." –Quemado participant

"…increased tree stand densities that has increased fire frequency and intensity and post fire flooding and water quality degradation." –Glenwood participant

"Ranching, logging, mining & recreation – important to families, schools, community. Needs to be important to management agency, FS." -Reserve participant

"Maintenance of campgrounds, trails, roads, etc. declining" –Mimbres participant

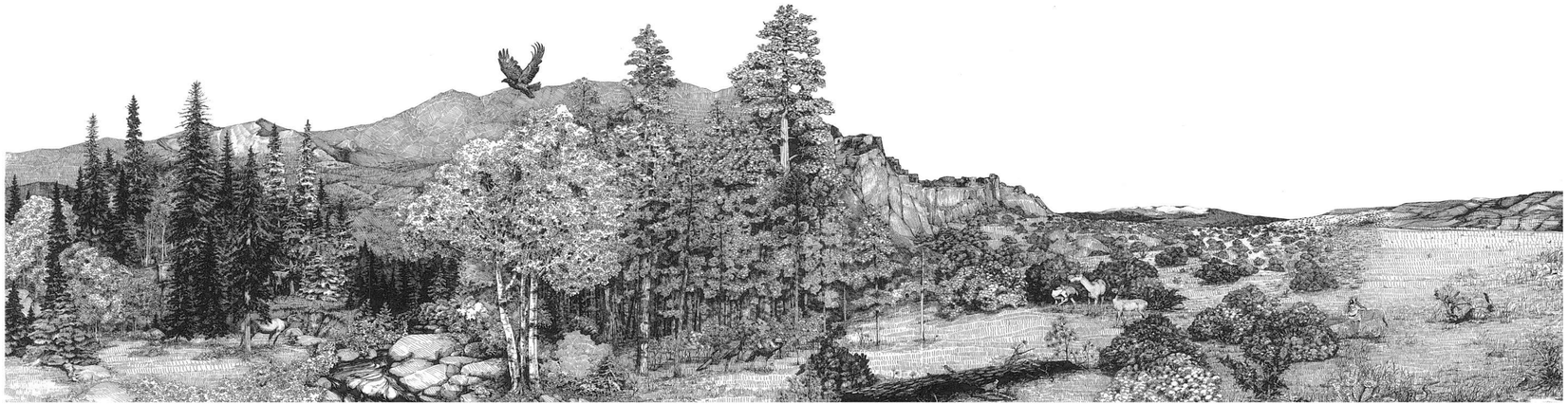
"Use the volunteer system to support forest plan. What needs to happen – use us. Fieldwork, monitoring, local support." –Truth or Consequences participant

"Fire needs to continue to be a natural process in the forest." –Silver City participant

What is a Need-for-Change Statement?

- Need-for-change statements broadly recommend how to change the 1986 Forest Plan.
- They are a bridge between the assessment findings and what will be in our revised Plan.
- The overarching question to be answered in developing needs-for-change statements is:

  What current plan direction needs to be revised (added, modified, or deleted) to address the conditions, trends, and most importantly risks identified in the assessment report?
- Areas identified as not moving in the right direction form the basis for need-for-change statements. If the current Forest Plan addresses an issue well and is moving in right direction, there is no need-for-change.
- Provides focus for the second phase of planning and development of the revised plan.
- Draft need-for-change document released in October.
- We want this to be a collaborative set of needs for change.
  - Input forms available to comment on draft needs-for-change statements as well as writing your own.
  - Your input is most useful if submitted before November 30.



Needs for change common to all program areas

There is a need…

- to reevaluate plan components based on new science, methods, and technologies.
- to include management approaches throughout the plan as appropriate that consider the capacity of local infrastructure, contractors and markets when planning towards desired conditions.
- to include plan guidance that will allow flexibility for fluctuations in Forest budgets over the life of the plan.
- for removing components that are redundant with existing laws, regulations and Forest Service policy. These should be incorporated by specific reference only, which will allow the plan to be up to date with the most recent versions without amendments.
- to reevaluate the number, arrangement, and boundaries related to current forest plan management areas, and base new ones on ecological boundaries such as Ecological Response Units
- to include plan direction that provides for adaptive management. There is also a need for plan components to be more strategic than prescriptive and for increased usage of management approaches based on best available science and monitoring.
- for a monitoring program that tracks progress toward desired conditions and allows for a responsive adaptive management program with available resources and uses updated terminology and methodologies especially for air quality, facilities, fire/fuels, lands, timber, and wilderness monitoring elements.

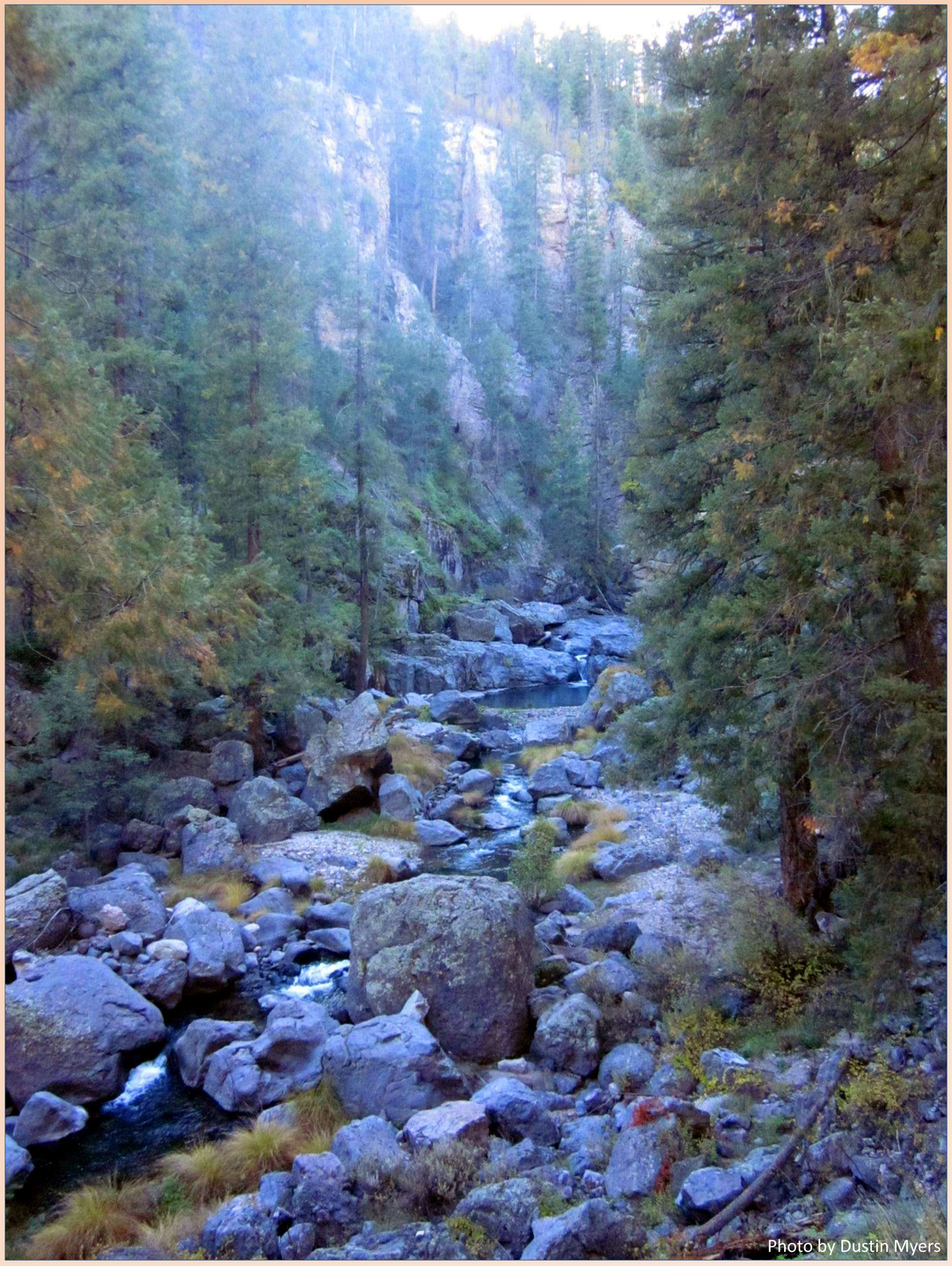


Photo by Dustin Myers

Assessment Topic

Current Conditions and Trends

Key Challenges and Opportunities for Sustainability

Here's where we are at (Current conditions)

Here's why
(Key issues, challenges, opportunities)

KEY TO POSTERS

Here's what we can do about it (Need for Change)

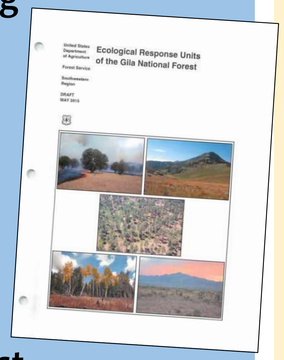
Here's where we think we are going (Future trends)

Needs For Change

Ecological Response Units of the Gila National Forest

Ecological Response Units (ERUs)

What are Ecological Response Units (ERUs)?



- Successful land management planning is based on dividing the landscape Into meaningful units.
- To facilitate analysis and planning in The Southwest, the Forest Service has developed a framework of Ecosystem types referred to as Ecological Response Units or ERUs.
- All major ecosystems in the Southwest are represented in this framework.
- The suite of vegetation classes that make up any given ERU share similar disturbance dynamics, plant species dominants, and theoretical succession sequences (potential vegetation).
- The focus is primarily on Forest Service System lands. Attempts have been made to characterize ERUs for all lands in Arizona and New Mexico to help facilitate cooperative landscape analysis and planning.

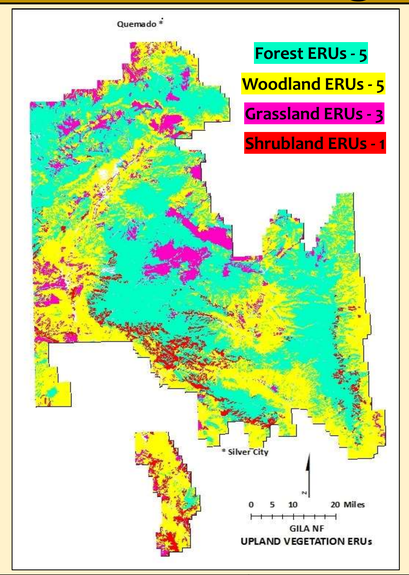
ERUs are Used to Define Historic/Reference Conditions within a Mapping Unit by Integrating:

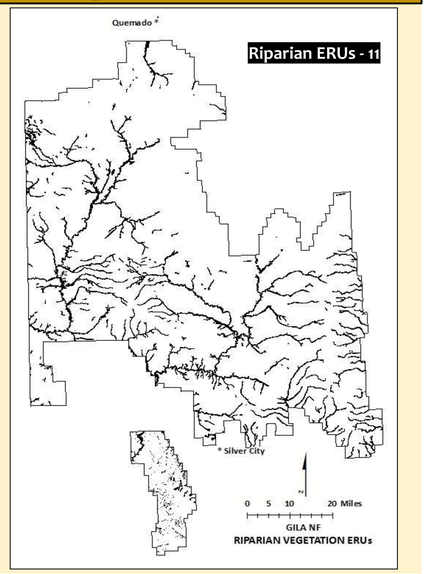
- Site potential (soil properties, geology, geomorphology, aspect, slope, climate variables, geographic location)
- Fire regime (historic and contemporary)
- Non-fire disturbance regimes (drought, insects and disease, flooding, wind events)
- Neighboring vegetation communities
- Structure and compositional representation
- Seral state sequence (successional dynamics)

Reference (Historical) Conditions *versus* Existing (Current) Conditions = Level of Departure

USDA FS (U.S. Department of Agriculture - Forest Service). 2015 (May). Ecological Response Units of the Gila National Forest (in draft). Southwestern Region. Albuquerque, NM. 76 pp.

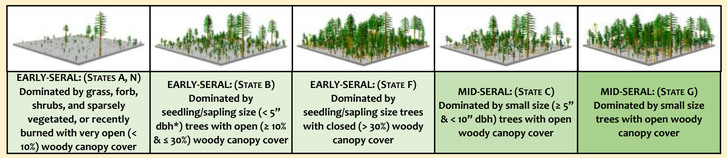
Gila NF Ecological Response Units





UPLAND ERUS	TOTAL UPLAND ERU AREA ON FOREST	
	ACRES	PERCENT OF GILA NF
FORESTS		
Ponderosa Pine Forest	630,280	19.3
Mixed Conifer Frequent Fire	396,244	12.1
Ponderosa Pine-Evergreen Oak	378,156	11.6
Mixed Conifer w/ Aspen	73,934	2.3
Spruce-Fire Forest	23,779	0.7
WOODLANDS		
Pinon-Juniper Woodland	848,440	25.9
Pinon-Juniper Grass	291,649	8.9
Juniper Grass	114,396	3.5
Madrean Pinon-Oak	17,361	0.5
Pinon-Juniper/Evergreen Shrub	10,678	0.3
SHRUBLAND		
Mountain Mahogany Mixed	166,488	5.1
GRASSLANDS		
Montane/Subalpine	113,785	3.5
Colorado Plateau/Great Basin	89,186	2.7
Semi-desert	55,988	1.7
TOTAL ACRES	3,210,364	98.1

RIPARIAN ERUS	TOTAL RIPARIAN ERU AREA ON FOREST	
	ACRES	PERCENT OF GILA NF
COTTONWOOD GROUP		
Narrowleaf Cottonwood/Shrub	22,681	0.71
Sycamore-Fremont Cottonwood	6,427	0.20
Fremont Cottonwood/Shrub	2,059	0.06
Fremont Cottonwood/Oak	85	0.003
DESERT WILLOW GROUP		
Desert Willow	8,929	0.278
MONTANE-CONIFER WILLOW GROUP		
Arizona Alder-Willow	3,222	0.100
Willow-Thinleaf Alder	1,054	0.033
Ponderosa Pine/Willow	862	0.027
Upper Montane/Conifer-Willow	670	0.021
WETLAND (CIENEGA) GROUP		
Herbaceous/Wetland Riparian	2,484	0.077
WALNUT-EVERGREEN TREE GROUP		
Arizona Walnut	1,655	0.052
Total Acres	54,128	1.686



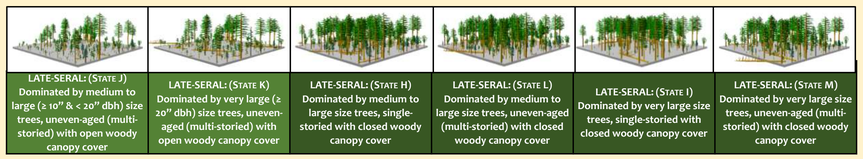
EARLY-SERAL: (STATES A, N) Dominated by grass, forb, shrubs, and sparsely vegetated, or recently burned with very open (< 10%) woody canopy cover

EARLY-SERAL: (STATE B) Dominated by seedling/sapling size (< 5" dbh*) trees with open (≥ 10% & ≤ 30%) woody canopy cover

EARLY-SERAL: (STATE F) Dominated by seedling/sapling size trees with closed (> 30%) woody canopy cover

MID-SERAL: (STATE C) Dominated by small size (≥ 5" & < 10" dbh) trees with open woody canopy cover

MID-SERAL: (STATE G) Dominated by small size trees with open woody canopy cover



LATE-SERAL: (STATE J) Dominated by medium to large (≥ 10" & < 20" dbh) size trees, uneven-aged (multi-storied) with open woody canopy cover

LATE-SERAL: (STATE K) Dominated by very large (≥ 20" dbh) size trees, uneven-aged (multi-storied) with open woody canopy cover

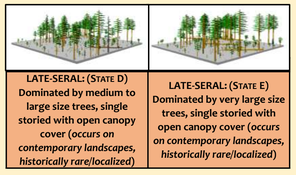
LATE-SERAL: (STATE H) Dominated by medium to large size trees, single-storied with closed woody canopy cover

LATE-SERAL: (STATE L) Dominated by medium to large size trees, uneven-aged (multi-storied) with closed woody canopy cover

LATE-SERAL: (STATE I) Dominated by very large size trees, single-storied with closed woody canopy cover

LATE-SERAL: (STATE M) Dominated by very large size trees, uneven-aged (multi-storied) with closed woody canopy cover

Graphic Depictions of Vegetation States within the MIXED CONIFER FREQUENT FIRE FOREST ERU



LATE-SERAL: (STATE D) Dominated by medium to large size trees, single storied with open canopy cover (*occurs on contemporary landscapes, historically rare/localized*)

LATE-SERAL: (STATE E) Dominated by very large size trees, single storied with open canopy cover (*occurs on contemporary landscapes, historically rare/localized*)

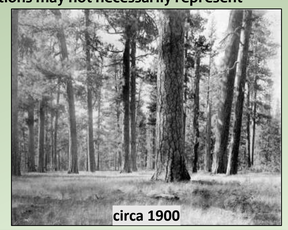
* dbh = Diameter measured at Breast Height (4 ½ ft.)

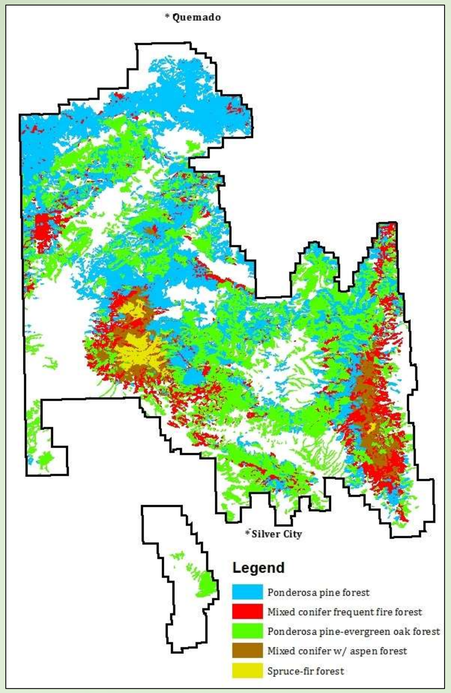
SERAL STATES	MIXED CONIFER FREQUENT FIRE FOREST SERAL STATE STRUCTURE, COMPOSITION AND COVER CLASS DESCRIPTION	PERCENT PROPORTION OF EACH SERAL STATE		
		REFERENCE CONDITION	GILA NF CURRENT CONDITION	SIMILARITY VALUES TO REFERENCE CONDITION
A, B, F, N	EARLY-SERAL: Grass, forb, shrubs, and sparsely vegetated or recently burned with very open (< 10%) woody canopy cover, and seedling/sapling size (< 5" dbh) trees with open (≥ 10% & ≤ 30%) or closed (< 30%) woody canopy cover	20	14	14
C	MID-SERAL: Small size (≥ 5" & < 10" dbh) trees with open woody canopy cover	10	4	4
D, E	LATE-SERAL: Medium to very large size (≥ 10" dbh) trees, single storied with open woody canopy cover (*occurs on contemporary landscapes, historically rare/localized*)	0	7	0
G	MID-SERAL: Small size trees with closed woody canopy cover	5	10	5
H, I, L, M	LATE-SERAL: Medium to very large size trees, single-storied or uneven-aged (multi-storied) with closed woody canopy cover	5	57	5
J, K	LATE-SERAL: Medium to very large size trees, uneven-aged (multi-storied) with open woody canopy cover	60	7	7
Total		100	100	36
MIXED CONIFER FREQUENT FIRE FOREST ERU DEPARTURE INDEX RATING FROM REFERENCE CONDITION = 100 - ∑ SIMILARITY VALUES: GILA NF = (100-36) = 64% = MODERATE DEPARTURE				

FORESTED VEGETATION TYPES FOUND ON THE GILA NATIONAL FOREST

Current Conditions and 100-Year Trends in Relation to Historical Conditions

HISTORIC CONDITIONS AS BASELINE REFERENCE
Environmental conditions that infer ecological sustainability. Historical conditions are often used as a baseline represented by the historic range of variation for a particular Forest Type, prior to Euro-American settlement and under the current climatic period. Historical conditions may not necessarily represent desired conditions. Reference conditions and current conditions are based on vegetation seral state overstory structure. See seral state structure graphics below.


circa 1900



Forested Types	Acres	Percent of Gila NF
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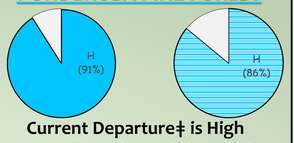
Mixed Conifer Frequent Fire	396,244	12.1
Ponderosa Pine-Evergreen Oak	378,156	11.6
Mixed Conifer w/ Aspen	73,934	2.3
Spruce-Fir Forest	23,779	0.7
Total Forests	1,502,393	46.8

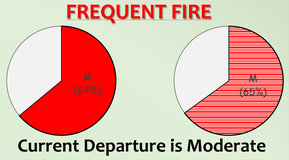
Current **100-Years†**

PONDEROSA PINE FOREST



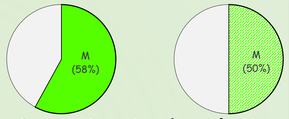
Current Departure‡ is High
100-Year Trend is Static in Relation to Reference Conditions

MIXED CONIFER FREQUENT FIRE



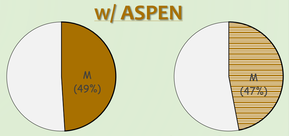
Current Departure is Moderate
100-Year Trend is Static in Relation to Reference Conditions

PONDEROSA PINE-EVERGREEN OAK



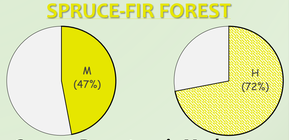
Current Departure is Moderate
100-Year Trend is Toward Reference Conditions

MIXED CONIFER w/ ASPEN



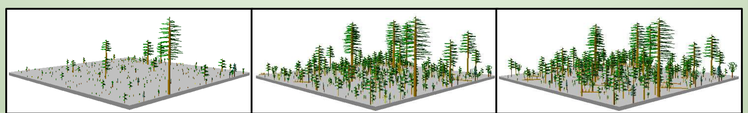
Current Departure is Moderate
100-Year Trend is Static in Relation to Reference Conditions

SPRUCE-FIR FOREST



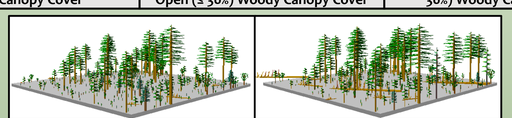
Current Departure is Moderate
100-Year Trend is Away from Reference Conditions

† Based on current management and fire activity
‡ Departure is the relative difference between existing and an historic reference condition



EARLY-SERAL: Grass, Forb and Shrub Dominated with Open (< 10%) Woody Canopy Cover | EARLY-SERAL: Seedling and Sapling Size (< 5" dbh*) Tree Dominated with Open (≤ 30%) Woody Canopy Cover | MID-SERAL: Small Size (≥ 5" & < 10" dbh) Tree Dominated with Open (≤ 30%) Woody Canopy Cover

Ponderosa Pine Forest Vegetation Seral State Overstory Structure



LATE-SERAL: Medium Size (≥ 10" & < 20" dbh)Tree Dominated with Open (≤ 30%) Woody Canopy Cover | LATE-SERAL: Large to Very-large Size (≥ 20" dbh) Tree Dominated with Open (≤ 30%) Woody Canopy Cover

* dbh = Diameter measured at Breast Height (4 ½ ft.)

Key Challenges to Ecological Sustainability of Forests

Dense tree growth with interlocking canopies creating the "fuel ladder effect"

Past fire suppression and historic livestock grazing practices, that are no longer in place, have contributed to departure from the natural range of variation in most ecosystems on the Gila NF by disrupting characteristic ecological processes, such as fire and natural vegetation succession. Other factors contributing to departure include: historic logging and fuelwood harvesting practices that removed the largest and most fire resistant trees; roads and trails that fragment the landscape and impede the spread of frequent, low-severity fire; drought; climate change; and uncharacteristic extents of stand replacement fire such as those experienced during the 2012 Whitewater Baldy Complex and 2013 Silver Fire.

2012 Whitewater Baldy Complex

2013 Silver Fire

Very large, multi-resource damaging fires (soils, vegetation, watershed, wildlife, etc.) are non-typical for ponderosa pine, ponderosa pine-evergreen oak and dry mixed conifer forests on the Gila NF

Some of the consequences of stand replacement fires

Risk to Ecological Sustainability Based on Significance of Departure and Trend

PONDEROSA PINE FOREST
potential risk due to legacy of past management or departure due to ongoing activities

MIXED CONIFER FREQUENT FIRE
potential risk due to legacy of past management or departure due to ongoing activities

PONDEROSA PINE-EVERGREEN OAK
risk addressed; continue current management

MIXED CONIFER w/ ASPEN
potential risk due to legacy of past management or departure due to ongoing activities

SPRUCE-FIR FOREST
potential for high risk

INCREASING RISK

Need for Change:

TO DEVELOP desired conditions regarding vegetation structure, composition, and function, that will promote ecological restoration, support resiliency and sustainability and minimize risks to ecosystem integrity and wildlife habitat.

TO RE-EVALUATE current plan direction regarding old growth forest based on the assessment findings regarding vegetation structure, composition, and function within the forested types. Vegetation structure has shifted from large to very-large size trees to a preponderance of small to medium size trees.

TO DEVELOP desired conditions, that reflect the restoration and maintenance of native herbaceous vegetation productivity, limits woody species infill and non-native invasive plant establishment, in all forested types.

Fire is recognized as an integral ecological process within the forest systems. See the Fire Poster for more information on the plan need for change necessary for restoration and maintenance of the sustainability of these forested communities.

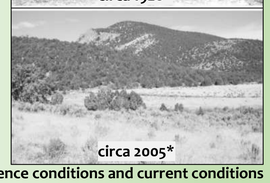
Low intensity surface fires for thinning, fuels reduction and understory vegetation restoration

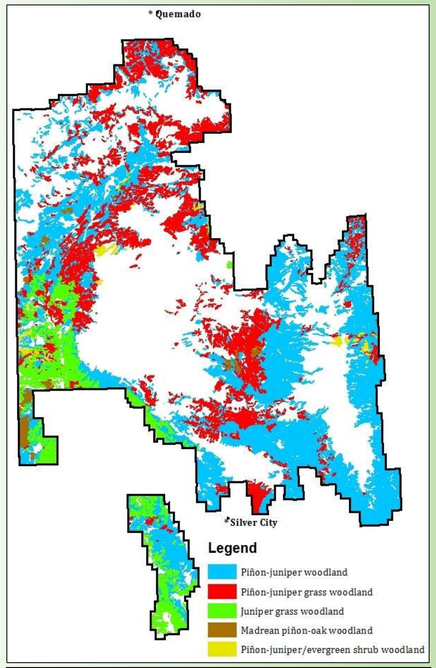
Promote and maintain aspen

WOODLAND VEGETATION TYPES FOUND ON THE GILA NATIONAL FOREST

Current Conditions and 100-Year Trends in Relation to Historical Conditions

HISTORIC CONDITIONS AS BASELINE REFERENCE Environmental conditions that infer ecological sustainability. Historical conditions are often used as a baseline represented by the historic range of variation for a particular Woodland Type, prior to Euro-American settlement and under the current climatic period. Historical conditions may not necessarily represent desired conditions. Reference conditions and current conditions are based on vegetation seral state overstory structure. See seral state structure graphics below.





Woodland Types	Acres	Percent of Gila NF
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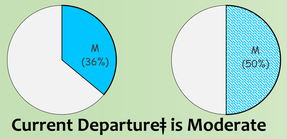
Juniper-Grass	114,396	3.6
Madrean Piñon-Oak	17,361	0.5
Piñon-Juniper/Evergreen Shrub	10,678	0.3
Total Woodlands	1,282,524	39.9

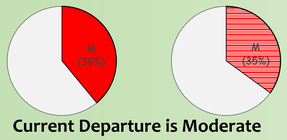
Current **100-Year†**

PIÑON-JUNIPER WOODLAND



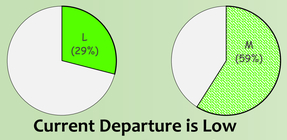
Current Departure‡ is Moderate
100-Year Trend is Away from Reference Conditions

PIÑON-JUNIPER GRASS



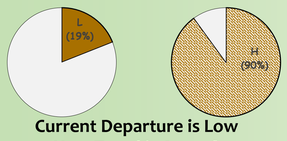
Current Departure is Moderate
100-Year Trend is Static in Relation to Reference Conditions

JUNIPER-GRASS



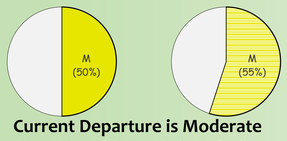
Current Departure is Low
100-Year Trend is Away from Reference Conditions

MADREAN PIÑON-OAK



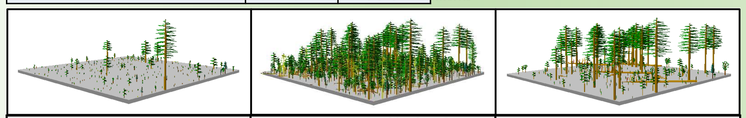
Current Departure is Low
100-Year Trend is Away from Reference Conditions

PIÑON-JUNIPER/ EVERGREEN SHRUB



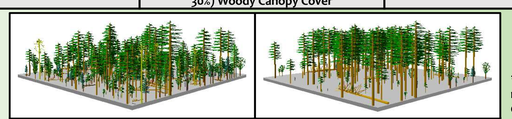
Current Departure is Moderate
100-Year Trend is Static in Relation to Reference Conditions

† Based on current management and fire activity
‡ Departure is the relative difference between existing and an historic reference condition
* Comparison photos from the Lloyd family & Lesley Morris



EARLY-SERAL: Grass, Forb and Shrub Dominated with Open (< 10%) Woody Canopy Cover	MID-SERAL: Combination of Seedling/Sapling Size (< 5" drc*) Tree Dominated with Open (≤ 30%) or Closed (> 30%) Woody Canopy Cover; and Small Size (≥ 5" & < 10" drc) Tree Dominated with Open (≤ 30%) Woody Canopy Cover	LATE-SERAL: Medium to Very Large Size (≥ 10" drc) Tree Dominated with Open (≤ 30%) Woody Canopy Cover

Piñon-Juniper Woodland Vegetation Seral State Overstory Structure



MID-SERAL: Small Size (< 10" drc) Tree Dominated with Closed (> 30%) Woody Canopy Cover	LATE-SERAL: Medium to Very Large Size (≥ 10" drc) Tree Dominated with Closed (> 30%) Woody Canopy Cover

* drc = Diameter measured at the Root Crown (ground level)

Key Challenges to Ecological Sustainability of Woodlands

Legacy issues related to the disruption of natural ecological processes by historic management, including reductions in fire frequency and/or changes in fire severity have contributed to increasing woodland stand densities of small to medium size trees. Grazing activities with unintended consequences during the 19th- and early- to mid-20th-centuries limited fine fuels (i.e. grasses and forbs) that typically carried frequent low-severity fire. Fragmentation or the construction of road and trail systems also impede the spread of frequent, low-severity wildfires across the landscape. Along with early- to mid-20th-century fire suppression activities, these changes contributed to shifts in species composition, changes in fuel types, distribution, vertical and lateral continuity and overall increases in fuel loading uncharacteristic of historic conditions. The increased density of small to medium size trees as a result of the infill of canopy gaps by tree and shrubs has also reduced the density, vigor and productivity of herbaceous understory plants in woodlands. These changes and the variable degrees of departure are reflected in the seral state proportion, mean patch size, coarse woody debris and ecological status (i.e. species composition) analyses in the assessment report. These departures from the historic fire regime contribute to increased risk of larger, higher severity fire.

Climate and Drought: Severe drought stressed and insect killed woodlands; piñon die-off in New Mexico was nearly 7 times higher than juniper mortality.

Drought and insect mortality, and increased stand densities has led to more uncharacteristic fire severity in the piñon-juniper woodland types

Legacy effects of past livestock, fire management, and landscape scale tree removal: homogenization of vegetation composition, age-class and structure

Risk to Ecological Sustainability Based on Significance of Departure and Trend

PIÑON-JUNIPER WOODLAND
potential for high risk

PIÑON-JUNIPER GRASS
potential risk due to legacy of past management or departure due to ongoing activities

JUNIPER GRASS
potential risk

MADREAN PIÑON-OAK
potential risk

PIÑON-JUNIPER/EVERGREEN SHRUB
potential risk

INCREASING RISK

Need for Change

Need to Develop desired conditions regarding vegetation structure (seral state proportion), composition, and function, as well as objectives, standards, guidelines and management approaches that will promote ecological restoration, support resilience and sustainability, and minimize risks to ecosystem integrity.

Need to Re-evaluate current plan direction regarding old growth forest and woodland based on the assessment findings regarding seral state proportions within the forested and woodland types. Seral state dominance has shifted from large to very-large size trees to a preponderance of small to medium size trees.

Need to Update current direction, develop desired conditions, standards and guidelines that promote the restoration and maintenance of native herbaceous vegetation (i.e. grasses and forbs) productivity, limits woody species encroachment/infill and non-native invasive plant establishment, in all vegetation types.

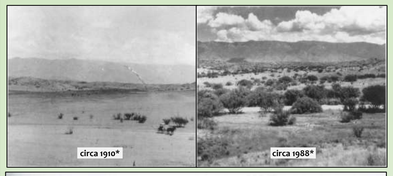
Fire is recognized as an integral ecological process within the woodland systems. See the Fire Poster for more information on the plan need for change necessary for restoration and maintenance of the sustainability of these woodland communities.

Productive herbaceous understory vegetation

Burning and thinning to promote herbaceous understory vegetation recovery

GRASSLAND VEGETATION TYPES FOUND ON THE GILA NATIONAL FOREST

Current Conditions and 100-Year Trends in Relation to Historical Conditions

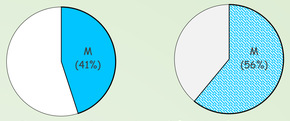


HISTORIC CONDITIONS AS BASELINE REFERENCE

Environmental conditions that infer ecological sustainability. Historical conditions are often used as a baseline represented by the historic range of variation for a particular Grassland Type, prior to Euro-American settlement and under the current climatic period. Historical conditions may not necessarily represent desired conditions. Reference conditions and current conditions are based on vegetation seral state overstory structure.

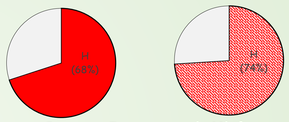
Current **100-Years†**

MONTANE/SUBALPINE GRASSLANDS



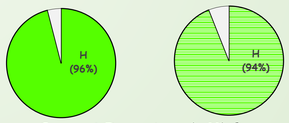
Current Departure‡ is Moderate
100-Year Trend is Away from Reference Conditions

COLORADO PLATEAU/ GREAT BASIN GRASSLANDS

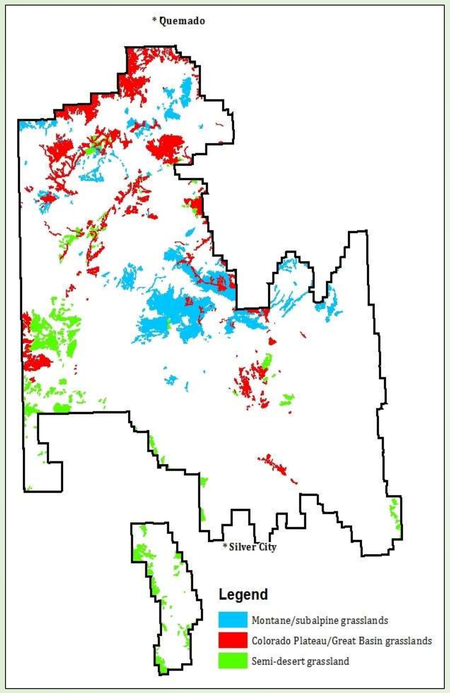


Current Departure is High
100-Year Trend is Away from Reference Conditions

SEMI-DESERT GRASSLAND



Current Departure is High
100-Year Trend is Static in Relation to Reference Conditions



Grassland Types	Acres	Percent of Gila NF
Montane/Subalpine	113,785	3.5
Colorado Plateau/Great Basin	89,186	2.8
Semi-desert	55,988	1.7
Total Grasslands	258,959	8.0

† Based on current management and fire activity
‡ Departure is the relative difference between existing and an historic reference condition
* Bahre, C.J.; and M.L. Shelton. 1993. Historic vegetation change, mesquite increases, and climate in southeastern Arizona. Journal of Biogeography 20(5): 489-504.
** Archer, S.; and L. Howery. 2009. Grasslands or shrubland? The School of Natural Resources, University of Arizona, Tucson, AZ. 5 pp.

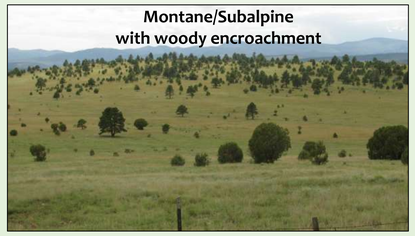
Key Challenges to Ecological Sustainability

Declines in herbaceous cover due to historical livestock grazing in concert with the disruption of the natural fire regime has been cited in a number of studies as the primary factors for the increase in woody species (tree and shrub) densities within grasslands. Currently: 35% of the Montane/Subalpine; 61% of the Colorado Plateau/Great Basin; and 96% of the Semi-desert grasslands are dominated by woody species.

Increased woody species densities not only raise the risk of uncharacteristic wildfires, but intensifies competition between plants for limited water, nutrients, sunlight and space. In turn, greater competition leads to increased stress, especially during periods of extended drought. Stress makes the entire plant community more susceptible to outbreaks of insects, pathogens, disease and invasion by non-native species.

Water stressed plants are more likely to die at lower fire severities than they would if they were not stressed.

Related concerns are the homogenization of the vegetation. The diversity of native plants contributes to the maintenance and enhancement of above- and belowground biological interactions that keep ecological interactions intact. Disruptions in plant diversity by loss of native species and shifts in species composition within these grasslands and the threat to native species posed by non-native invasive species that spread in response to human activities create a host of issues related to ecosystem health.



Risk to Ecological Sustainability Based on Significance of Departure and Trend

MONTANE/ SUBALPINE GRASSLANDS
potential for high risk

COLORADO PLATEAU/GREAT BASIN GRASSLANDS
potential risk due to legacy of past management or departure due to ongoing activities

SEMI-DESERT GRASSLAND
potential risk due to legacy of past management or departure due to ongoing activities

INCREASING RISK

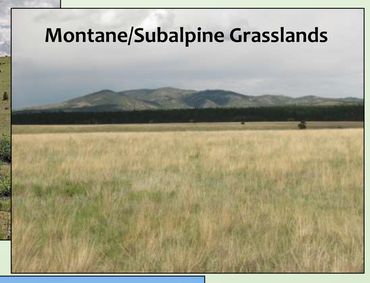
Need for Change

1. Need to Develop desired conditions regarding vegetation structure (seral state proportion), composition, and function, as well as objectives, standards, guidelines and management approaches that will promote ecological restoration, support resilience and sustainability, and minimize risks to ecosystem integrity.

2. Need to Update current direction, develop desired conditions, standards and guidelines that promote the restoration and maintenance of native herbaceous vegetation (i.e. grasses and forbs) productivity, limits woody species encroachment/infill and non-native invasive plant establishment, in all three grasslands.

Fire is recognized as an integral ecological process within the grassland systems. See the Fire Poster for more information on the plan need for change necessary for restoration and maintenance of the sustainability of these grassland

Restoring grasslands though woody plant removal



Fire

Natural Ecological Process

Historical Photo of Fire Suppression Hand Crew

Fire is a natural ecological process and an integral part of many ecosystems. Characteristic wildfire frequency, severity, extent and patterns depend on vegetation type and are influenced by a multitude of factors including site-specific forest structure, landscape characteristics and climatic conditions.

Historical Photo of Helicopter Suppression

Relationships between past fire suppression policy and historic livestock grazing practices contributed to altered fuel characteristics in many vegetation types. Fire suppression contributed to increases in woody vegetation and fuel loading. Historic livestock grazing practices reduced fine fuels and contributed to increases in woody vegetation as a result of altered competition dynamics between woody and herbaceous species.

2015 Meekins 1 Prescribed Fire, Wilderness Ranger District

The Gila NF became one of the first national forests to begin using fire as a restoration tool in the mid to late 1970s. Since 1977, over 1,400 wildfires have been managed on more than 565,000 acres. Over the last two decades, the Forest has averaged 11,326 acres of prescribed fire per year.

Acres are not necessarily contiguous and many prescribed or natural fires may have burned the same piece of ground more than once. Actual acres of fire are greater than the amounts reported above as most records prior to 1984 have not been entered into the database and are hardcopy only.

There have been approximately 2,502 wildfires where suppression has been the management goal. These fires have burned over a million acres. 884 of these fires and half of these acres burned between 2011 and 2013.

Large fires within this time frame include the 2012 Whitewater Baldy Complex Fire and 2013 Silver Fire which contributed to mean patch size and seral state proportion departures in Spruce Fir-Forest and Mixed Conifer with Aspen. Although stand replacement fire is characteristic of these systems, the extents were uncharacteristic.

2012 Whitewater Baldy Complex Fire near Sheridan Mountain

Fire in Riparian Ecosystems

With few exceptions, the current scientific understanding is that natural fire frequency and severity are less in riparian areas than surrounding uplands. Fires occur less often and at lower severity due to higher relative humidity and fuel and soil moisture. Effects depend on the relationships between fire frequency, severity and timing, climatic conditions, vegetation community composition and landscape characteristics.

Riparian species experience mortality even with low severity fire. Willows are the only riparian species on the Gila NF that have been observed to re-sprout after fire with any reliability.

Upland Ecological Response Unit	Historic Average Fire Return Interval (Years)	Historic Fire Severity	Current Average Fire Frequency (Years)	Current Fire Severity Departure from Historic
Spruce-Fir Forest	200 to 400	High Severity/Stand Replacement	17	Low
	100 to 200	Mixed Severity		
Mixed Conifer with Aspen	50 to 150	High Severity/Stand Replacement and Mixed Severity	24	Low
Mixed Conifer-Frequent Fire	9 to 22	Low Severity	16	Moderate: Severity has Increased
	Less frequent than 9 to 22	Mixed Severity		
Ponderosa Pine Forest	0 to 35	Low Severity	40	Low
Ponderosa Pine-Evergreen Oak	Supported a range of fire regimes depending on whether or not the understory was predominantly grass or shrub	Grass Dominated Understory = Low Severity Shrub Dominated Understory = Mixed Severity	36	Low
PJ Woodland	35 to 200 years with some subtypes exhibiting little to no natural fire	High Severity/Stand Replacement	144	High: Severity has Decreased
PJ Evergreen Shrub	35 to 200	Mixed Severity	429	High: Severity has Decreased
Madrean Piñon-Oak Woodland	35 to 200	Mixed Severity	633	Low
PJ Grass	0 to 35	Low Severity	154	Low
Juniper Grass	0 to 35	Low to Moderate Severity	>1,000	Low
Mountain Mahogany Mixed Shrubland	0 to 35	High Severity/Stand Replacement	32	High: Severity has Decreased
Colorado Plateau-Great Basin Grassland	0 to 35	High Severity	564	High: Severity has Decreased
Montane Subalpine Grasslands	0 to 35	High Severity	33	Moderate: Severity has Decreased
Semi-Desert Grassland	0 to 35	High Severity	760	Moderate: Severity has Decreased

Sustainability: Key Challenges and Opportunities

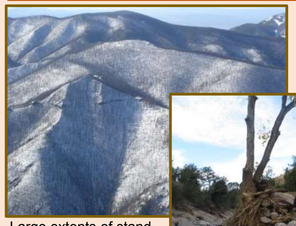
Firefighter and Public Safety are the primary considerations of fire management in determining the course of action or inaction for any given fire.

- Weather Patterns, Drought and Climate Change
- Adequate Fine Fuels
- Long-Term Monitoring
- Air Quality/Smoke Management
- Declining Budgets

Partnerships and Stakeholder Support are critical to implementing prescribed fire and accelerating the Gila NF's fire program in the face of declining budgets

Tyrone, Fort Bayard and Whiskey Creek Volunteer Fire Departments Partnered with the Gila NF to implement the Silver City Ranger District's 2016 Cameron Creek Prescribed Fire

Effects from any one fire are rarely all positive, or all negative



Large extents of stand replacement fire in areas important for snowpack following the 2012 Whitewater Baldy Complex Fire increase potential sublimation and evaporation

Downcutting in Silver Creek following the 2012 Whitewater Baldy Complex Fire

Ponderosa Pine Forest in McKenna Park September 2016: Recent wildfires include 2016 McKenna, 2012 Whitewater Baldy Complex, 2011 Miller, 2010 Horse and 2003 Dry Lakes Fires

Needs For Change

There is a need to update current plan direction to allow for an integrated resource approach to increase flexibility for restoration and maintenance of fire as an ecological process in fire adapted ecosystems while addressing public safety and health concerns, especially in the Wildland Urban Interface.

There is a need for plan direction that recognizes the natural processes of fire (e.g., natural fire regimes) and their use as management tools to help achieve desired conditions appropriate to each vegetation type across the landscape.

There is a need for plan direction that allows managers the flexibility to manage naturally ignited fires to meet resource objectives based on weather and site-specific conditions. These actions may include the use of fire to reduce excess fuels, moderate the risk of future uncharacteristic fires, improve wildlife and range habitat, and improve watershed and overall forest health

There is a need to update the plan to address vegetation structure within the Wildland Urban Interface (WUI) since these areas will have different desired conditions than non-WUI areas to encourage lower fuel loading and fire behavior.

Soil

Soil Resources on the Gila NF

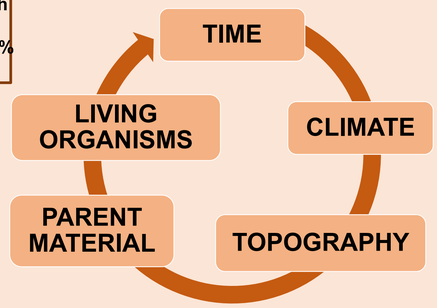
Mollisols are naturally highly productive soils. They occur in all Ecological Response Units. ~85% of the Forest.

Alfisols are also fertile soils, but less so than Mollisols. They occur within most Ecological Response Unit but are most often found in forest types. ~6% of the Forest

Vertisols and Mollisols with vertic properties are also naturally productive soils. Their high clay content makes them more susceptible to compaction which decreases productivity. ~<1% of the Forest

Entisols are relatively young soils with little development as they occur in landscape settings where erosion and deposition is happening faster than the rate of soil formation. Entisols are common in the Forest's Riparian areas with very high natural productivity. Where they occur in upland settings, productivity is much lower. ~2% of the Forest

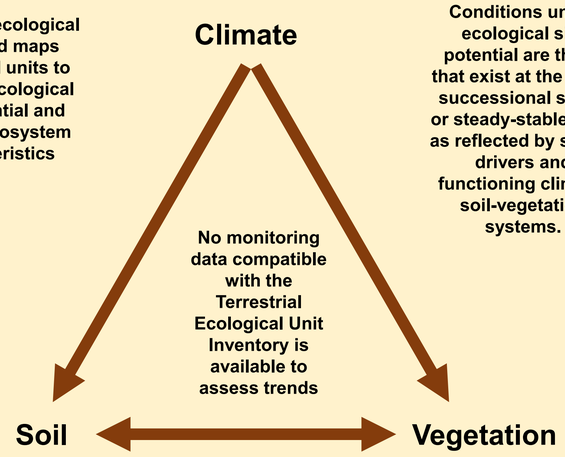
Inceptisols are more developed than Entisols as they occur on young, but more stable landforms. Productivity is highly variable. They are primarily found on rhyolite within forest types. ~7% of the Forest



Soil profile images taken from "The Twelve Orders of Soil Taxonomy" poster by the USDA Natural Resource Conservation Service available at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2_053588

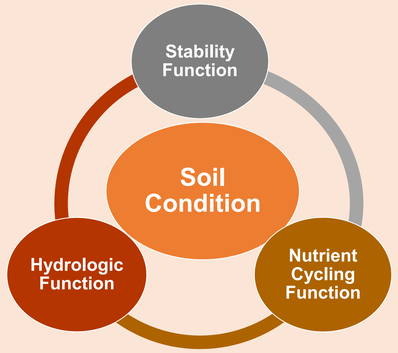
Terrestrial Ecological Unit Inventory

Classifies ecological types and maps ecological units to interpret ecological site potential and current ecosystem characteristics



Conditions under ecological site potential are those that exist at the latest successional stage, or steady-stable-state as reflected by stable, drivers and functioning climate-soil-vegetation systems.

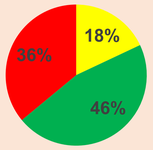
Current Upland Soil Conditions



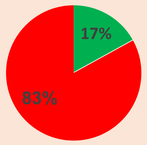
Satisfactory: Indicators signify that soil function is being sustained. Ability of soil to maintain resource values and sustain outputs is high.

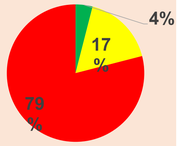
Impaired: Indicators signify a reduction of soil function. Ability of soil to function properly has been reduced and/or there exists an increased vulnerability to degradation.

Unsatisfactory: Indicators signify a loss of soil function has occurred. Inability of soil to maintain resource values, sustain outputs, and recover from impacts

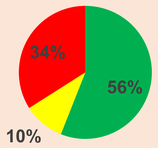


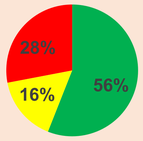
The status of soil functions in **MIXED CONIFER-FREQUENT FIRE** are driven by management activities that reduce vegetative groundcover, primarily related to mechanical thinning and fire. Natural instability is also a factor.



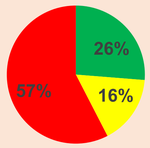


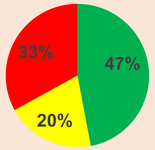
The status of soil functions in **SPRUCE-FIR FOREST (LEFT) AND MIXED CONIFER WITH ASPEN (RIGHT)** are driven by extents of stand replacement fire. Natural instability is also a factor.

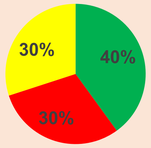




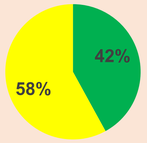
The status of soil functions in **PONDEROSA PINE FOREST (TOP) AND PONDEROSA PINE EVERGREEN OAK (BOTTOM)** are driven by the same factors described for Mixed Conifer-Frequent Fire and the woodland types. Natural instability is a factor, but less so than Mixed Conifer-Frequent Fire and PJ Woodland.



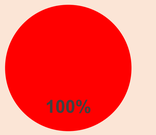




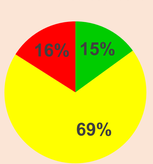
The status of soil functions in **PJ WOODLAND (LEFT), PJ GRASS (CENTER) AND JUNIPER GRASS (RIGHT)** are driven by the legacy of historic livestock grazing management including erosional processes, shifts in vegetative community composition and compaction. Current management has allowed for improvement but slows recovery rates. Natural instability is also a factor with the strongest influence in PJ Woodland.

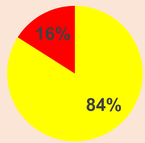


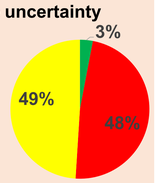
The status of soil functions in **PJ EVERGREEN SHRUB (LEFT) AND MADREAN PIÑON-OAK WOODLAND (RIGHT)** are driven by the same factors described for the other woodland types but limitations associated with the amount and distribution of data available to describe conditions increase uncertainty



The status of soil functions in **MOUNTAIN MAHOGANY MIXED SHRUBLAND** only reflects this type where it occurs in the Burro Mountains due to the available data. Legacy issues related to historic livestock grazing are particularly strong in this area of the Forest and granitic parent materials are less resilient than many others. Natural instability is also a factor.







The status of soil functions in **COLORADO PLATEAU-GREAT BASIN GRASSLAND (LEFT), MONTANE SUBALPINE GRASSLANDS (CENTER) AND SEMI-DESERT GRASSLAND (RIGHT)** are driven by same factors described for the woodland types. The influence of natural instability on the status soil functions in the grassland types is limited.

Sustainability: Key Challenges and Opportunities

Hillslope failure and pedestalled rock in untreated monitoring plots on the 2013 Silver Fire

- Legacy issues related to fire suppression and livestock grazing
- Drought and climate change
- Large extents of stand replacement fire
- Monitoring
- Partners and Volunteers

All current and future management actions and inactions pose both challenges and opportunities to the soil resource

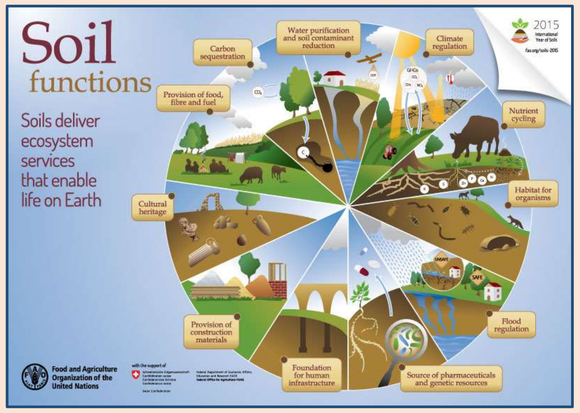
Photo credit: Morgan Varner From Joint Fire Science "Chewing the Landscape: Masticated Fuelbeds Pose Novel Challenges"

USFS Adaptive Management Services Enterprise Team and Joint Fire Science Red Mountain Mastication Study, Sequoia National Forest http://www.fs.fed.us/adaptivemanagement/projects_main_red_mtn_mastication.php

Soil is non-renewable resource due to the slow rate of soil formation in the climate of the Southwestern United States where it has been estimated that it can take between 300 and 1000 years to form an inch of soil.

Needs For Change

There is a need to update plan direction to restore, maintain and sustainably manage soil condition



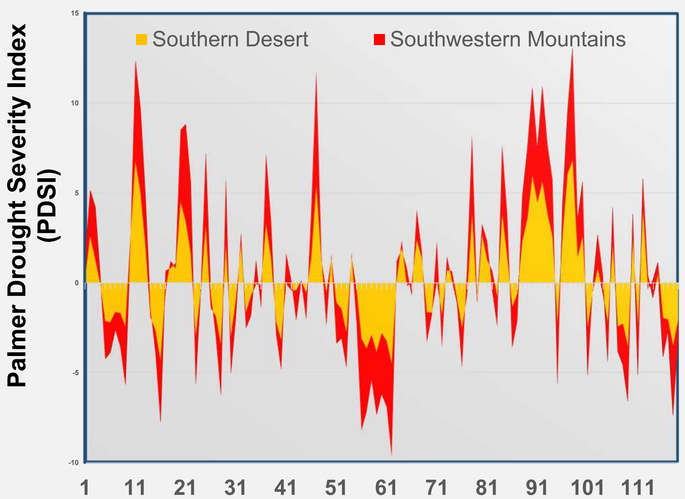
Climate, Climate Change and Vulnerability

Climate is a Primary Ecosystem Driver

Climate, or the average weather, is the primary ecosystem driver. It largely determines the timing, quantity, duration and distribution of available water and influences all ecological processes and ecosystem characteristics including the potential natural vegetation community, natural rates of soil formation and loss, fire regimes and patterns of insects and disease.

Drought

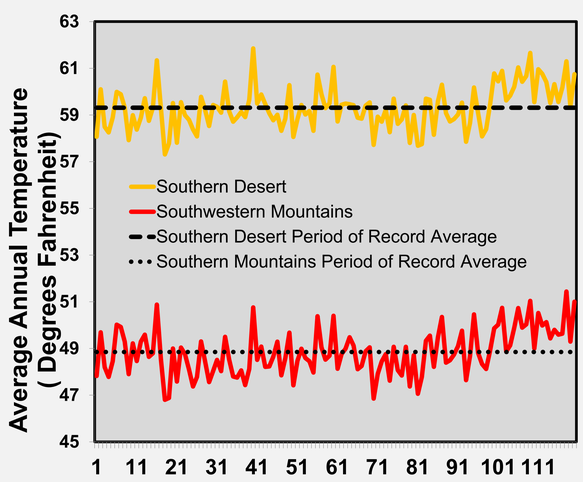
Droughts are normal and recurrent climatic features. Drought impacts can include but are not limited to reduced streamflow; reduced water quantity and reliability of upland water sources; reduced vigor, growth, regeneration and resilience of riparian species; reduced canopy cover, vigor, growth and seed production in grasses, reduced vegetative groundcover and decreased fuel moisture. Cascading effects include increased risk of insect and/or disease outbreak, wildfire, erosion, sedimentation and downward trends in rangeland condition



Negative Values Indicate Drought Years

Climate Change is a Ecosystem Stressor

In the Southwest, climate modelers agree a drying trend will continue, with temperature being a stronger driver than precipitation. Temperature increases are expected to increase evaporation such that an overall decrease in available moisture remains likely, even if precipitation increases. The greatest warming is expected to occur in winter. Climate change is also projected to increase the frequency, severity and duration of droughts. While the region is expected to get drier, it is likely to see larger, more destructive flooding events as rising temperatures may increase storm intensity, duration, or both.



Climate Change Vulnerability Assessment

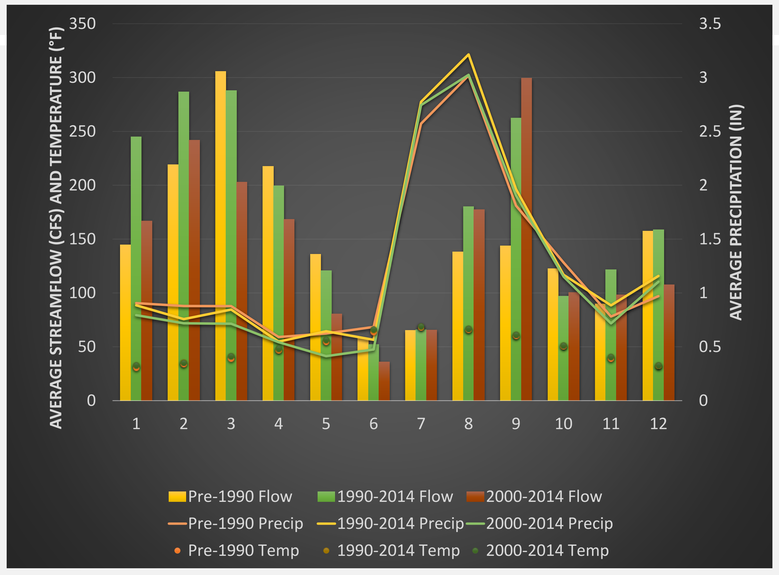
- **The Forest Service Southwestern Region and the Rocky Mountain Research Station developed the Climate Change Vulnerability Assessment (CCVA) for the Gila NF in 2015.**
- **This is an ecosystem-based vulnerability assessment for all major upland ecosystems based on the anticipated effects of climate change.**
- **Four vulnerability categories are reported: low, moderate, high and very high.**
- **Vulnerability categories are accompanied by uncertainty categories to account for differences in the predictions of climate models. These categories are low, moderate and high.**
- **Essentially, the assessment describes the relative susceptibility of an ecological type conversion. For example, the conversion of Mixed Conifer Frequent Fire type to a Gambel oak shrubland type.**

ERU Name	ERU Acres on the Gila NF	ERU Percent of Gila NF	CCVA Vulnerability Rating	CCVA Uncertainty Rating
Spruce-Fir Forest	23,779	1	Very High	Low
Mixed Conifer-Frequent Fire	367,209	11	Moderate to High	Moderate
Mixed Conifer with Aspen	51,908	2	Moderate to Very High	Low to Moderate
Ponderosa Pine Forest	630,294	19	Moderate to High	Moderate
Ponderosa Pine Evergreen Oak	378,157	12	Moderate	Moderate
Mountain Mahogany Mixed Shrubland	166,488	5	Low to Moderate	Moderate
Madrean Piñon-Oak Woodland	17,361	1	Low to Moderate	Moderate
PJ Woodland	848,447	26	Low to Moderate	Moderate
PJ Evergreen Shrub	10,679	<1	Not Assessed	Not Assessed
PJ Grass	291,647	9	Moderate	Moderate
Juniper Grass	114,396	3	Moderate to High	Moderate
Montane Subalpine Grassland	113,806	3	Moderate	Moderate to High
Semidesert Grassland	55,993	2	Low to Moderate	Moderate
Colorado Plateau Great Basin Grassland	89,033	3	Moderate	Moderate
Gila NF Uplands Total	3,159,197	97	Moderate	Moderate

Vulnerability is also summarized by watershed, but these ratings are not accompanied by uncertainty ratings. Although riparian systems were not specifically analyzed, some inferences can be made related to their vulnerability based on the watershed summary

	Percent of ERU by Subwatershed Vulnerability Rating		
Ecological Response Unit	Moderate	High	Very High
Arizona Alder-Willow	48	52	0
Arizona Walnut	89	11	0
Desert Willow	68	32	0
Fremont Cottonwood-Shrub	94	6	0
Herbaceous Wetland	93	7	0
Walnut-Ponderosa Pine	100	0	0
Narrowleaf Cottonwood-Shrub	77	23	0
Ponderosa Pine-Willow	100	0	0
Sycamore-Fremont Cottonwood	75	25	0
Upper Montane Conifer-Willow	74	26	0
Willow-Thinleaf Alder	56	44	0

At the six USGS streamflow gages on Forest streams, average streamflow has decreased in the winter and spring months, peak snowmelt runoff is occurring earlier and the snowmelt runoff period is decreasing as illustrated below by the Gila River near Gila gage data. These changes are consistent with climate change projections and have enormous ecological and socioeconomic implications.



Mean Monthly Precipitation, Temperature and Streamflow Metrics for the Gila River Gage near Gila

Water

Water Resources on the Gila NF

San Francisco River upstream from confluence with Big Dry Creek

957 miles of perennial streams

546 miles of intermittent streams

Some of these stream miles support wetlands

Source of water for downstream uses, local communities, recreation, and wildlife habitat

Wetland/Riparian Habitat Restoration Project at Vigil Springs

918 mapped springs / seeps

Not all are perennial

2,718 acres of wetlands not associated with streams

Sources of water and centers of high productivity, wildlife activity and biological diversity

Jones Tank July 2013

In New Mexico, the use of water occurring as natural waters, constructed waterbodies and groundwater is declared public and subject to appropriation for beneficial use. Water allocation, construction of infrastructure and use is authorized and administered by the State of New Mexico. In New Mexico, beneficial uses of water include:

- Domestic Use
- Livestock and Wildlife Watering
- Irrigation
- Prospecting and Mining
- Construction of public works, highways and roads

Current Streamflow Conditions and Trends

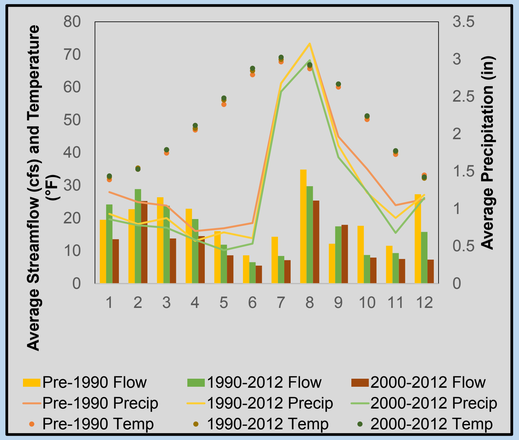
Streamflow Characteristic	San Francisco River near Reserve	San Francisco River near Glenwood	Mogollon Creek near Cliff	Gila River near Gila	Gila River near Redrock	Mimbres River at Mimbres
Mean Annual Flow	-56%	-16%	-13%	-3%	-8%	-35%
Median Annual Flow	-36%	-7%	-33%	-6%	-8%	-35%
High Flow Days	-100%	+77%	+193%	+50%	+<1%	-15%
Low Flow Days	+184%	-42%	+51%	-81%	+38%	+299%

Percent Change in Annual Streamflow Characteristics Between Pre-1990 Gage Data and Post 2000 Gage Data

- All gages demonstrate drying trends to varying degrees
- Some gages indicate increased variability in flow while others demonstrate decreased variability
- In general, this means less water is available annually to support terrestrial, riparian, and aquatic habitat and wildlife and downstream uses, and less predictability of timing, duration and magnitude of flows

Mimbres River at Mimbres Example of Monthly Climatic and Streamflow Characteristics over the Period of Record (1979-2012)

- Average Streamflow has decreased in the winter and spring months
- Peak snowmelt runoff is occurring earlier
- Peak snowmelt runoff period is decreasing
- Duration of late spring-early summer low flow periods are increasing



Sustainability: Key Challenges and Opportunities

Gila River between Murdock's Hole and Grapevine Campground

- Drought and Climate Change
- Watershed and Riparian Condition
- Water Demand and Future Development
- Fire
- Road Density, Maintenance and Proximity to Water

Changes in Streambed Elevation **have the potential to dry the system by altering the connections between surface and groundwater.**

Incised Perennial Stream and Disconnected Wet Meadow within the Luna Restoration Project Currently in the Planning Phase

Forest management has no ability to control or influence cycles of drought, climate change, water allocation or water use, but should look for opportunities to:

- **Enhance adaptation by anticipating and planning for disturbances from intense storms**
- **Reduce watershed vulnerability by restoring and maintaining resilient ecosystems**
- **Increase water conservation and plan for reductions in upland water supplies**

Current Groundwater Conditions and Trends

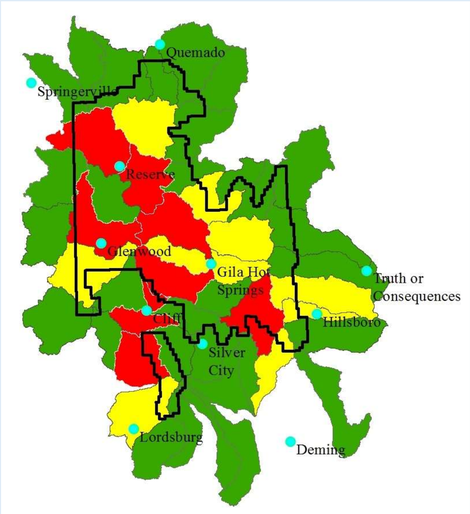
Groundwater recharge rates are naturally slow but are expected to decline due to:

- **Altered snowpack characteristics resulting from large contiguous areas of stand-replacement fire**
- **Increases in temperature, evaporation and sublimation**
- **Reductions in precipitation falling as snow**
- **Increases in frequency, severity and duration of drought**

Snowpack in the Mogollon Mountains

Groundwater quality data is lacking; isolated issues or concerns exist where historic mines, landfills, septic systems or leaky underground fuel tanks occur near or on the Forest

Current Surface Water Quality Conditions and Trends



Green indicates 0-33% of subwatersheds contain streams listed by the state of New Mexico as Impaired OR have been identified by the Gila NF for other water quality concerns

Yellow indicates 34-66% of subwatersheds contain streams listed by the state of New Mexico as Impaired OR have been identified by the Gila NF for other water quality concerns

Red indicates >66% of subwatersheds contain streams listed by the state of New Mexico as Impaired OR have been identified by the Gila NF for other water quality concerns

Available information is not suitable to assess trend

Needs For Change

There is a need to update plan direction for the sustainable management of water resources

Little Cherry Creek

Watershed

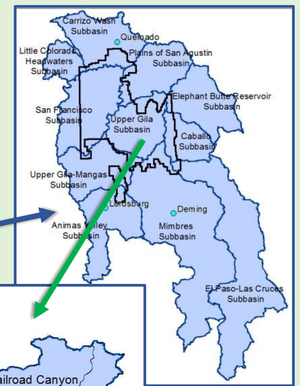
Gila NF Watersheds

Watersheds are a topographically defined area that drains to a single point in a stream or river system

Watersheds are cataloged using a hierarchical system developed by the United States Geological Survey

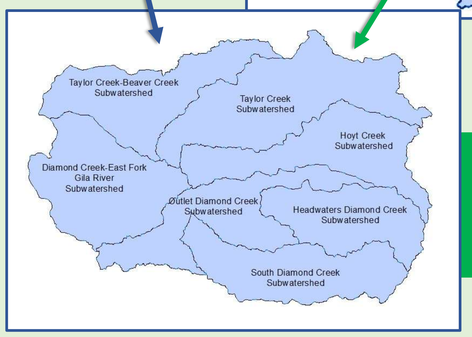
There are six levels of hydrologic units of which the Gila NF Assessment considers three

- Subbasins (4th level)
- Watersheds (5th level)
- Subwatersheds (6th level)



Gila NF Subbasins

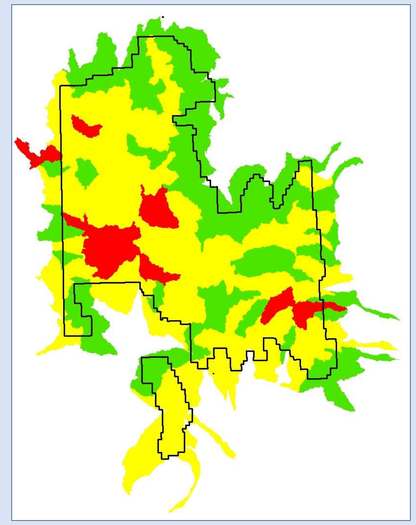
Upper Gila Subbasin Watersheds



Headwaters East Fork Gila River Watershed Subwatersheds

Current Watershed Conditions

Overall Subwatershed Condition



Functioning Properly

Functioning at Risk

Impaired Function

These classifications reflect an weighted average of all 12 indicators

Not all indicators are given the same weight

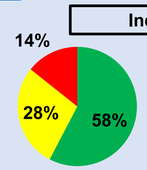
Subwatersheds that are Functioning Properly overall, may have some indicators that are Functioning at Risk or Impaired Function

Subwatersheds that are Functioning at Risk or Impaired Function overall, may have some indicators that are Functioning Properly

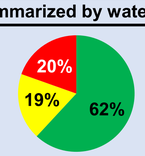
No data appropriate for assessing trend in watershed condition is available

The classification is public and online at http://apps.fs.fed.us/nfs/nrm/wcatt/WCFMapviewer/

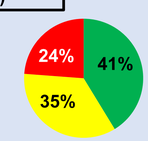
Indicator ratings summarized by watershed (5th level)



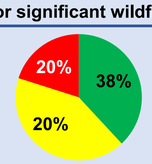
Water Quantity: Changes to the natural flow regime resulting from water diversions, controls or significant wildfire



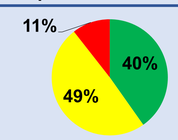
Water Quality: Waters listed Impaired by the state of New Mexico and those that are not but evidence of water quality problems exists



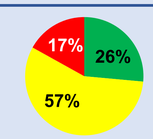
Aquatic Habitat: Fragmentation, large woody debris, and channel shape and function



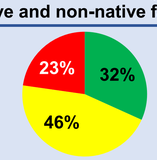
Aquatic Biota: Distribution, structure and density of native and non-native fauna



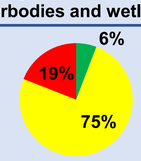
Riparian/Wetland Vegetation: Function and condition of native riparian vegetation along streams, waterbodies and wetlands



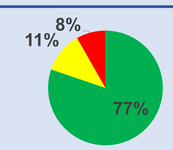
Roads and Trails: Changes to hydrologic and sediment regimes due to density, location, distribution and maintenance



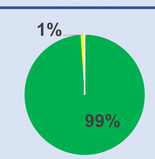
Soil Condition: Extent of alteration to natural soil condition



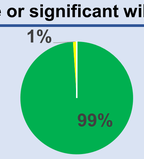
Fire Regime or Wildfire Effects: Potential for altered hydrologic and sediment regimes due to departures from the historical fire regime or significant wildfire



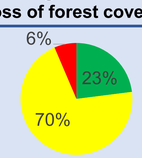
Forest Cover: Potential for altered hydrologic and sediment regimes because of loss of forest cover



Forest Health: Forest mortality impacts to hydrologic and soil function due to native and invasive pests, insect, and disease outbreaks and air pollution



Terrestrial Invasive Species: Potential impacts to soil, vegetation and water resource



Rangeland Vegetation Condition: Impacts to soil and water relative to vegetative health of rangelands

Sustainability: Key Challenges and Opportunities

Stand-Replacement Fire in Spruce-Fir Forest of the Upper Whitewater Creek Subwatershed; While Stand Replacement Fire is Characteristic of this System, the Extents Experienced in Recent Years is Uncharacteristic.

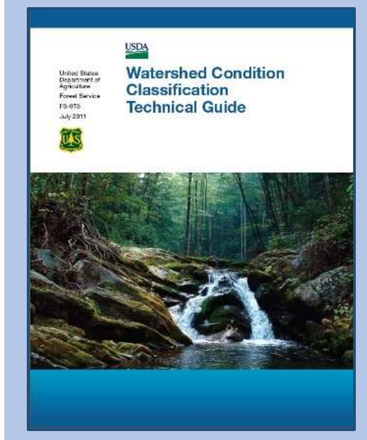
- Drought and Climate Change
- Water Demand
- Road Density, Maintenance and Proximity to Water
- Legacy Issues Related to Fire Suppression and Livestock Management
- Cumulative Effects of All Current and Future Management Actions or Inactions
- Partners and Volunteers

Fire represents both a challenge and an opportunity to watershed resiliency and sustainability depending on the frequency, pattern, severity, and extent of those severities that occur.

Resilient and sustainable watersheds are supported by fire when it is allowed to fulfill its role as a natural ecological process specific to the ecosystems within a watershed

Watershed Recovery Following the 2013 Silver Fire in the Black Range

Watershed Condition Classification



The technical guide is public and online at http://www.fs.fed.us/sites/default/files/legacy_files/media/types/publication/field_pdf/watershed_classification_guide2011FS978_0.pdf

3 Condition Classes

- Functioning Properly
- Functioning at Risk
- Impaired Function

12 indicator model

1. Water Quality
2. Water Quantity
3. Aquatic Habitat
4. Aquatic Biota
5. Riparian/Wetland Vegetation
6. Soil Conditions
7. Roads and Trails (Motorized)
8. Fire Regime or Wildfire Effects
9. Forest Cover
10. Forest Health
11. Terrestrial Invasive Species
12. Rangeland Vegetation Condition

Needs For Change

There is a need to update plan direction to restore, maintain and sustainably manage watershed condition

Gattons Park 1 Prescribed Fire Spring 2016 Wilderness Ranger District

Riparian Ecosystems

Gila NF Riparian Ecological Response Units

Fall Colors Along the Gila River Riparian Corridor

Ecological Response Unit	Acres	Percent of Riparian Total
Arizona Alder-Willow	2,893	5
Arizona Walnut	1,176	2
Desert Willow	11,157	20
Fremont Cottonwood-Shrub or Oak	2,882	5
Herbaceous Wetland	2,841	5
Walnut-Ponderosa Pine	367	<1
Narrowleaf Cottonwood-Shrub	24,870	43
Ponderosa Pine-Willow	846	15
Sycamore-Fremont Cottonwood	9,454	16
Upper Montane Conifer-Willow	636	1
Willow-Thinleaf Alder	963	2
Gila NF Total	58,085	100

Post-Fire Flooding Change Detection

The Meadow along the Middle Fork Gila River in 2011

The Meadow along the Middle Fork Gila River 2014

Significant changes in riparian species canopy cover, and hydrologic and sediment regimes resulting from post-fire flooding events are detectable by comparing pre- and post-satellite imagery.

Ecological Response Unit	Observable Change (% Area)
Arizona Alder-Willow	66
Arizona Walnut	3
Desert Willow	6
Fremont Cottonwood-Shrub	3
Herbaceous Wetland	5
Walnut-Ponderosa Pine	0
Narrowleaf Cottonwood-Shrub	24
Ponderosa Pine-Willow	1
Sycamore-Fremont Cottonwood	24
Upper Montane Conifer-Willow	30
Willow-Thinleaf Alder	77
Area Weighted Forest Total	25

Current Riparian Conditions

Key to Table:

ND = No Data
L = Within Historic Range Of Variability
M = Moderate Departure from Historic Range of Variability
H = High Departure from Historic Range of Variability

Ecological Response Unit and Riparian Groups	Key Ecosystem Characteristic Departure from Historic Range of Variability					
	Seral State Proportion	Ecological Status	Vegetative Groundcover	Vegetation Condition and Function	Channel Shape and Function	Flood Frequency
Cottonwood Group	M	M	M	M	M	M
Narrowleaf Cottonwood/Shrub	M	L	M	M	M	M
Sycamore-Fremont Cottonwood	M	M	M	M	M	H
Fremont Cottonwood/Shrub	M	M	M	M	M	M
Fremont Cottonwood-Oak	M	ND	ND	M	M	M
Montane-Conifer Willow Group	M	H	H	M	H	M
Arizona Alder-Willow	M	H	H	M	H	M
Willow-Thinleaf Alder	M	H	H	M	H	M
Ponderosa Pine/Willow	M	ND	ND	M	M	M
Upper Montane Conifer/Willow	M	M	H	M	H	M
Wetland (Cieñega) Group						
Herbaceous Riparian	L	M-H	H	M	M-H	H
Walnut-Evergreen Tree Group	M	L	L	M	M	L
Arizona Walnut	M	L	L	M	M	L
Walnut/Ponderosa Pine	M	ND	ND	M	M	L
Desert Willow Group						
Desert Willow	M	M	L	M	L	L

Post-Fire and Flooding Recover of Willows along Whitewater Creek

Saltcedar Treatments along the Gila River

Approximately 19% of the Forest's riparian acres are currently excluded from livestock grazing to improve riparian and aquatic habitat conditions, including much of the San Francisco and Gila Rivers. 15% of riparian acres occur in wilderness or wilderness study areas and additional acres are located within closed allotments

Sustainability: Key Challenges and Opportunities

User-created road along the San Francisco River near the San Francisco Hot Springs

- Drought and Climate Change
- Water Diversions or Controls
- Invasive Species
- Watershed Condition
- Fire Management
- Roads and Trails
- Herbivory
- Inventory and monitoring

There is a great deal of interest in the health and resilience of the Forest's riparian ecosystems. The Forest's relationships with Partners, Volunteers and other Stakeholders hold many current and future potential opportunities to support riparian health and resilience.

Stream Channel Downcutting in Silver Creek Following the 2012 Whitewater Baldy Complex Fire and Extreme Precipitation Event in 2013

NMDOT and Gila NF 2016 Partnership: Riparian Plantings on the West Fork Gila River near the Gila Cliff Dwellings

Successful Riparian Restoration Project at the Gila Bird Area along the Gila River

Just prior to restoration (May 1996)

12 years after restoration (August 2008)

Needs For Change

There is a need to update plan direction to inventory, restore, maintain and sustainably manage riparian areas, including those associated with springs, seeps and wetlands

At-Risk Species

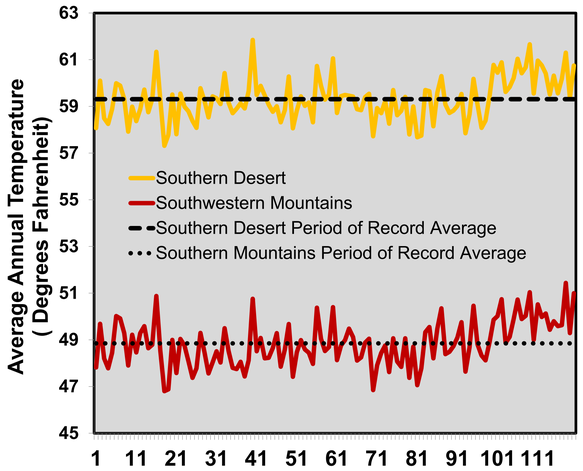
Current Conditions and Trends

61 At-risk species on Gila NF

47 Species of Conservation Concern (SCC):
- 26 invertebrates
- 17 plants
- 2 mammals
- 1 fish
- 1 bird

14 Threatened, Endangered, Proposed or Experimental, non-essential:
- 7 fish
- 3 birds
- 2 reptiles
- 1 mammal
- 1 amphibian

Challenges/Opportunities

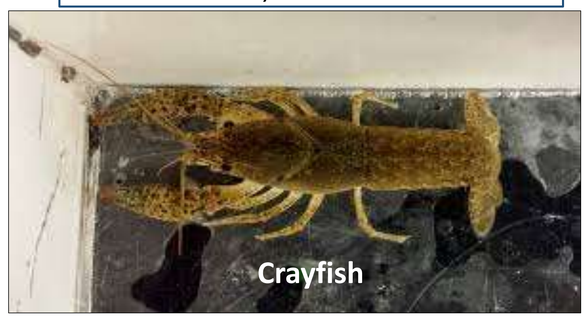


Drought is a natural reoccurring climatic feature that decreases water availability.

Climate Change is a threat expected to have cascading effects due to increases in the frequency, severity and duration of drought. This could lead to decreased stream flow, warmer water, changes in vegetation types through drying out of sites, which could lead to the isolation of populations.

Invasive Species can hybridize, prey upon, or outcompete native species for resources (e.g. crayfish, saltcedar, and Tree-of-heaven).

Collecting/Overexploitation can be a serious threat to populations that are sufficiently low, easily accessible, and highly desirable.



Uncharacteristic Wildfire has the potential to dramatically change vegetation types through drying out of systems.

Disease has the potential to eliminate species populations from wide areas (e.g. Sylvatic plague)

Risk

There is substantial concern about at-risk species capability for long-term persistence on the Gila National Forest.

Vegetation/Habitat Departure

Low = green, Moderate = yellow, High = red
0-33% 34-66% 67-100%

ECOLOGICAL RESPONSE UNITS	GILA NATIONAL FOREST	
	CURRENT DEPARTURE	100-YEAR MODELING PERIOD DEPARTURE
Ponderosa Pine Forest	91	86
Ponderosa Pine-Evergreen Oak	58	50
Mixed Conifer Frequent Fire	64	65
Mixed Conifer w/ Aspen	49	47
Spruce-Fir Forest	47	72
Piñon-Juniper Woodland	36	50
Piñon-Juniper Grass	39	35
Juniper Grass	29	59
Madrean Piñon-Oak	19	90
Piñon-Juniper/Evergreen Shrub	50	55
Mountain Mahogany Mixed Shrubland	64	61
Montane/Subalpine Grasslands	41	56
Colorado Plateau/Great Basin Grasslands	68	74
Semi-desert Grassland	96	94
Cottonwood Group (CWG[1])	45	no data
Desert Willow Group (DWG[2])	35	no data
Montane/-Conifer Willow Group (MCWG[3])	44	no data
Wetland (cienega) Group (WET[4])	15	no data
Walnut-Evergreen Tree Group (WET[5])	49	no data

[1] CWG = Cottonwood Group: Narrowleaf cottonwood/shrub; Sycamore-Fremont cottonwood; Fremont
[2] DWG = Desert Willow Group: Desert willow
[3] MCWG = Montane-Conifer/Willow Group: Arizona alder-willow; Willow-thinleaf alder; Ponderosa
[4] WEG = Walnut-Evergreen Tree Group: Arizona walnut
[5] WET = Wetland (cienega) Group: Herbaceous/wetland riparian with no data (nd)

Species Risk is determined by identifying threats to species and their key ecosystem characteristics, as well as species population trends, distribution, and abundance.

Needs For Change

There is a need to update plan direction to provide for conservation and recovery of federally recognized species, as well as maintain viable populations of species of conservation concern and other native species.

There is a need to provide plan direction that allows for managing toward terrestrial, riparian and aquatic habitat and population connectivity for species movement across the landscape; and restoring the range of native species.

Hunting / Fishing / Wildlife Viewing

Current Conditions and Trends

Hunting

- **Culturally, hunting and fishing have been important activities and long standing traditions on the Forest.**
- **Hunting and fishing contribute importantly to the social and economic sustainability of southwestern New Mexico.**
- **The table below shows total number of jobs, income, and taxes statewide and by county from hunting, trapping, and fishing in 2013.**

Location	Jobs	Labor Income	Local, State & Federal Taxes
New Mexico	7,936	$267,920,790	$106,493,369
Catron County	259	$3,703,806	$2,675,882
Grant County	187	$4,760,746	$2,514,814
Hidalgo County	21	$502,401	$278,245
Sierra County	153	$3,370,197	$1,506,065
Four County Total	620	$12,337,150	$6,975,006

(Southwick Associates 2014)

Mule deer

Habitat Stamp Program
The Gila NF has been receiving an average of $115,000 per year from New Mexico Department of Game and Fish for development and maintenance of water sources, road access, fencing, and aquatic and terrestrial habitat improvements (e.g. trick tank below).

Black Mesa Trick Tank

Fishing

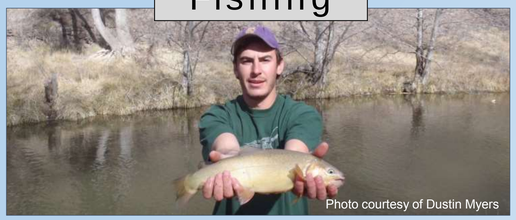


Photo courtesy of Dustin Myers

Sportsmen participation and expenditures statewide and by county by activity in 2013.

Location	Hunters	Economic Value	Trappers	Economic Value	Anglers	Economic Value
New Mexico	86,384	$342,368,654	1,639	$3,493,874	160,311	$267,717,023
Catron County	12,406	$15,018,759	109	$71,283	7,328	$1,841,330
Grant County	6,802	$8,902,764	161	$114,044	10,141	$6,452,871
Hidalgo County	2,281	$1,619,381	29	$16,107	153	$112,231
Sierra County	5,329	$4,357,758	29	$16,090	14,983	$8,073,156
Four County Total	26,818	$29,898,662	328	$217,524	32,605	$16,479,588

(Southwick Associates 2014)

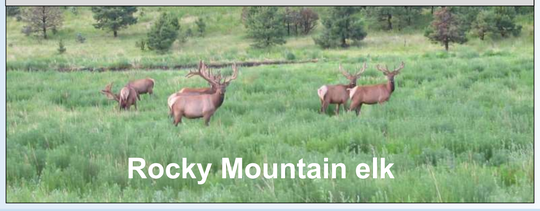
Outfitting / Guiding

- The Gila NF is known for its trophy animals, particularly elk, which attract hunters from all over the country. This has provided opportunities for a number of commercial outfitter/guides to operate on the Gila NF under a special use permit.
- On the Gila National Forest, an average of 139 permits are issued to outfitters and guides per year. Based on Forest Service annual revenue collected, it is estimated that an average $2,159,000 in gross revenue is generated annually from outfitter and guide activities on the Forest.

Fiscal Year	No. of Permits	Reported Revenue
2010	131	2,188,274.00
2011	143	2,159,373.67
2012	132	2,357,139.33
2013	128	1,778,180.33
2014	131	2,350,166.00
2015	125	2,118,501.33
Average	139	2,158,605.78

Wildlife Watching
In 2011, 566,000 people participated in wildlife watching activities. Wildlife watchers spent $327 million in the state of New Mexico on equipment and travel.

Western tanager


Rocky Mountain elk

Challenges / Opportunities for Sustainability

Drought **is a natural reoccurring climatic feature that decreases water availability, presenting a challenge to recreational fishing.**

Infrastructure **has deteriorated in some instances. There is an opportunity to improve facilities through maintenance.**

Snow Lake boat ramp maintenance
Photo courtesy of Matt Schultz

Uncharacteristic Wildfire
has the potential to dramatically alter habitat types for a variety of wildlife species. Post-fire flooding can negatively impact recreational fishing opportunities through ash, debris, and sediment impacts to streams, but can also provide an opportunity for native Gila trout reintroduction.

2013 Silver Fire
Photo courtesy of Ellen Brown

Partnerships
have been utilized as part of the Habitat Stamp Program to help develop and implement projects on the Forest. A variety of partners have been involved including Sierra Club, Rocky Mountain Elk Foundation, National Wild Turkey Federation, Trout Unlimited, Mule Deer Foundation, and New Mexico Department of Game and Fish.

Fish Barriers
have been constructed to protect and restore native species. Non-native species occurring below the barriers still provide recreational opportunities.

Willow Creek fish barrier
Photo courtesy of Andy Dean, USFWS

Invasive Species
can hybridize, prey upon, or outcompete native species for resources, as well as become vectors for disease spread (e.g. Chytrid).

Bullfrog

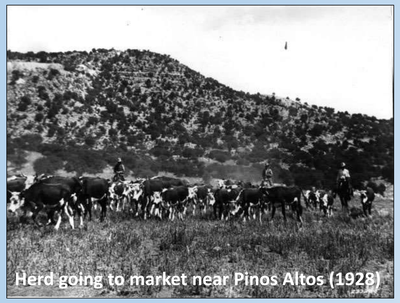
Fish Stocking
Since 2008, sterile rainbow trout and channel catfish are stocked only in the lakes within the Gila NF. Certain streams are now stocked with Gila trout or Chihuahua chub to promote native fish recovery.

USFWS photo/ J. Galvez

Social, Cultural, and Economic Conditions

Current Demographic Conditions and Trends

The Gila NF offers a unique setting in terms of history, diversity, and economic conditions. The Gila NF continues to play a prominent role in the long-standing traditions and uses of the area.


Herd going to market near Pinos Altos (1928)

Traditional Uses

Providing for traditional uses has been a part of forest management on the Gila NF since its inception in the early 1900s. These uses are still important in the Forest's social and economic landscape and include activities such as grazing, firewood gathering, plant collecting, timber harvesting, and hunting and fishing.

In addition to serving the local population, the Gila NF also offers visitors who travel to the region a unique experience in culture, vast scenic landscapes, and activities such as hunting and backpacking.

There is strong attachment to the land by area residents and visitors.

The current social environment includes:

- a multi-cultural heritage
- traditional use economies transitioning to include tourism and amenity uses
- an outdoor lifestyle
- a changing population mix with an increased presence of retirees and other newcomers
- average household income tends to be lower compared to New Mexico and the nation
- younger people are leaving the area in search of jobs which are limited in the area
- a strong local environmental presence
- some polarized natural resource issues that have created social tensions
- The area's population is expected to be relatively constant for the next two decades

Understanding the unique characteristics, trends, history, and challenges of the area communities is an important consideration for public land managers working to meet the needs of the public.

Key Challenges/Opportunities for Sustainability

Reopening ceremony for the Catwalk

Building Relationships with Communities

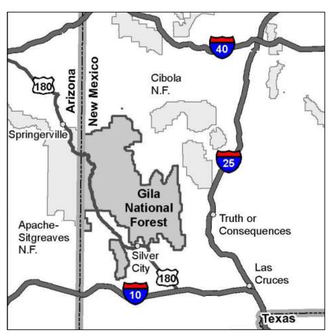
The Forest is an integral part of many of the local communities it serves. Building community relationships is vital in forest management that meets the needs of its users in addition to providing healthy ecosystems.

Economic Contributions

The Gila NF is a significant contributor to local economies. Overall, the Forest contributes over 981 jobs and $28.7 million to the local economies.

Program Area	Employment	Labor Income
Recreation	71	$2,666,000
Grazing	434	$5,579,000
Timber	8	$314,000
Minerals	0	$0
Payments to Counties	69	$1,487,000
Forest Service Expenditures	400	$18,654,000
Total	981	$28,700,000

Note: The economic contribution analysis considers only the market transactions that result from activities on the Gila NF., and does not include the numerous non-market social and economic values are associated with the Forest.



Remoteness

One of the biggest economic challenges of counties in the immediate area is their remoteness, especially the long distance to markets. However, isolation may have some advantages in terms of slower pace of life and affordable housing. Other economic challenges include changes in market demands and regulations.

Partnerships

There is a desire for more partnerships amongst the Forest Service, local governments, state and other federal agencies, communities, and stakeholder groups especially in times of declining budgets.

Community meeting in Mimbres

Community Outreach and Involvement

Community outreach and involvement is necessary for public participation in the management of their national forest, the Gila National Forest.

From Grant County CWPP

Wildland Urban Interface

Six percent of the homes found within the four county area are located in the Wildland Urban Interface. The Gila NF has planned and implemented many projects to reduce the potential undesirable effects of wildfires within these areas (e.g., prescribed burning and mechanical treatments to reduce fuels).

West Fork of the Gila River

Restoring and Sustaining Healthy Ecosystems

Healthy ecosystems significantly contribute to the social and economic benefits people obtain from the Forest. Restoration of forests, grasslands, and watersheds has broad agreement, offers potential economic benefits to local communities, and is a potential foundation for future collaboration with stakeholders throughout the area.

Needs For Change

There is a need to better recognize and enhance the Forest's role in contributing to local economies through recreation and tourism, timber and forest products, livestock grazing, and other multiple-use related activities and products while balancing these uses with available resource capacity and emerging opportunities.

There is a need to include management approaches throughout the plan as appropriate that utilize collaboration with stakeholders, partnerships and volunteer opportunities as a management option to promote movement toward desired conditions. This includes management approaches that encourage working with neighboring land managers to implement projects at a scale that improves landscape scale connectivity across mixed ownerships where natural systems, such as watersheds and wildlife corridors, span multiple administrative boundaries.

There is a need for management approaches that can strategically leverage and streamline processes for engaging partners and volunteers during project implementation and monitoring.

There is a need for management approaches that emphasize public education about the Gila NF's diverse ecological, social, and economic resources, the multiple-use sustained yield philosophy, public laws and regulations, and management strategies.

Rangelands

Current Conditions and Trends

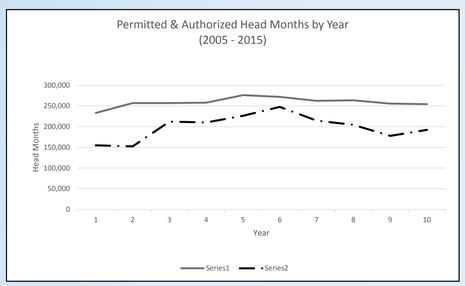
Gila NF Range Niche

The Gila National Forest administers one of the largest grazing programs in the Southwest Region. Ranching historically has been a part of the base traditional social and economic structure of the surrounding counties. Many members of these rural communities have historical ties to ranching, and many families continue in this profession for livelihood and for culture and traditions to pass down to future generations.

- 2.6 million acres under livestock grazing permits
- 138 active and 3 closed grazing allotments
- 1910-1960 grazing on the Gila NF was reduced by 64%

Permitted & Authorized Head Months

- Forest Service began administering grazing allotments in 1899
- Fluctuations in authorized use reflect non-use for resource concerns due to drought and/or personal convenience



Note: Head month (HM) is a month's use and occupancy of rangeland by one weaned or adult cow, bull, steer, heifer, horse, burro, or mule, or five sheep or five goats. Head months are used for grazing fee calculation and collection purposes.

Grazing plays an important role in the local area economy. The Gila National Forest grazing program contributes approximately 434 jobs, $5.5 million in labor income, and $34 million in total output to the four-county area.

Conditions of Rangelands

- After decades of grazing, rangeland conditions on the Forest have improved substantially.
- The majority of rangeland is in fair condition with stable to upward trends.
- There are areas of good and poor condition range.
- More than half of surveyed riparian areas are Properly Functioning.
- There are surveyed riparian areas Functioning At Risk and a small percentage Non-Functional.

Key Challenges/Opportunities to Sustainability

Environmental Disturbances

- Fire effects
- Climate change and associated drought which limits available water sources for livestock
- Conifer encroachment in open grassland areas
- Invasive species introduction & establishment

Dry stocktank

Woody encroachment into grasslands

Tree of heaven

Bull thistle

Spotted knapweed

Range Developments

- Some developments are non-functional due to lack of maintenance
- New developments resulting from range analysis contribute to better distribution of livestock and provide water for wildlife.

Management Challenges

- Wildfire can provide long term benefits to maintaining the ecological integrity of grasslands and preventing woody species encroachment.
- Fire management activities pose short-term management challenges as the herbaceous vegetation providing forage is also the resource providing the fine fuels necessary to carry fire. There is also a need to rest areas from grazing after fire to provide for watershed and forage recovery, resulting in the need to find other pastures or allotments to graze.
- The need to move livestock due to the presence of species listed as threatened or endangered present similar management challenges, especially Mexican wolf-livestock conflicts.
- Competition for forage between livestock and elk is an ongoing concern for livestock producers.

Risk

Issues affecting rangeland sustainability are concerning for many communities adjacent to the Forest for whom ranching is a way of life. Future management that focuses on the restoration and maintenance of ecological integrity is needed to address these sustainability issues.

Needs For Change

There is a need to update plan direction for livestock management that incorporates increased flexibility in order to restore and maintain ecological integrity of rangelands.

Timber and Special Forest Products

Important Resources on the Gila NF

Plant products are important resources available from the Gila NF including:

- **Firewood is a source of heat for the homes of many people within the area.**
- **Lumber, posts, poles, and traditional building materials (e.g., latillas and vigas) are culturally and economically important.**
- **Special forest products (e.g., Christmas trees and transplants/wildings)**

Current Conditions and Trends of Forested Areas

- **Out of 3.3 million acres on the Gila NF, nearly 2.8 million acres (84%) are considered to be forested, of which about 432,361 acres (13%) are designated as suitable for timber production under the existing Forest Plan.**
- **As a result of the 1996 Regional guidance for northern goshawk habitat and Mexican spotted owl recovery, the forestry program shifted emphasis from even-aged to uneven-aged forest management.**
- **Wood products are currently a byproduct of other management objectives, such as improving functionality of watersheds across large landscapes, rather than a primary objective.**
- **A new mill in Reserve can handle more capacity and a wider range of material, resulting in a dramatic increase in the number of acres treated mechanically and the volume of material removed from the Forest. The Forest also provides material to several portable saw mills in the region as needed.**
- **The timber base largely draws from the Ponderosa Pine-Evergreen Oak, Ponderosa Pine Forest and Mixed Conifer-Frequent Fire Ecological Response Units. These systems are currently vulnerable to uncharacteristic wildfire and a variety of insects and diseases. Large scale disturbance could potentially affect the availability of timber resources on the Forest.**

Trends Driving Supply and Demand of Timber and Special Forest Products

- Supply and demand for timber is driven by regional, national, or global forces.
- Local drivers are smaller in scope and scale, and generally have only minor effects on the overall market for timber and lumber products.
- In addition to supplying the mill, demand for woody material from the Forest is largely driven by firewood needs. The demand for firewood by communities has remained stable to slightly increasing over the last five years, primarily due to higher cost of natural gas and propane delivery versus the availability of wood in close proximity to the communities the Gila NF serves.

Post harvest on Black Timber Sale Reserve Ranger District

Post harvest on Deer Timber Sale Reserve Ranger District

Thinning within Reserve WUI (Rancho Grande)

Prescribed Burn in Burro Mountains

Contributions of Timber and Special Forest Products to Ecological Sustainability

- The Forest has increased the number of forestry treatments it implements, to improve forest health, reduce potential for uncharacteristic wildfire, and make forest products more available.
- Prescribed cutting methods used to accomplish restoration objectives place more emphasis on developing diversity in forest structure, age classes, and species composition. This approach generally includes selective cutting methods paired with prescribed burning.
- Uneven-aged forest conditions, promoted by current management, are considered more resilient to natural disturbance, and thus more sustainable.
- Current tree growth rates are commonly slow, and stand vigor is declining as competition for water, nutrients, and growing space has increased as a result of higher tree density.
- Thinning promotes vigor by reducing competition and removing less vigorous individuals.

Impacts of Timber Harvest on Ecological Integrity and Species Diversity

- Past management activities have altered stand structure, composition, and fire occurrence patterns.
- Some ponderosa pine and dry mixed conifer stands are overly dense, have an overabundance of shade tolerant species, and are often even-aged and multi-storied.
- Timber management activities target restoration of forest and woodland ecosystem structure, composition and function.
- Short-term negative impacts to forest soils and hydrology can be expected from timber management activities. These effects are typically mitigated by limiting operations to slopes under 40%, and limiting the extent of disturbance and proximity to riparian and/or other sensitive areas.
- Long-term benefits to ecosystem resilience, disturbance regimes, biodiversity, hydrologic function, wood product availability, aesthetics and recreation can outweigh short-term negative impacts.

Needs For Change

There is a need to update plan direction based on results of a new timber suitability analysis.

There is a need to update plan direction so that restoration efforts allow for commercial and non-commercial products to be available to the public.

Recreation

Gila NF Recreation Niche

From wilderness to western heritage, visitors to the ***Gila National Forest have the opportunity to 'find themselves' in the wildness of the forest. The*** *essence of the Gila is the freedom to explore vast expanses of backcountry. Heritage and cultural connections allow local communities, Native Americans, and recreationists to establish long-term bonds with the forest. Traditional gathering of forest products and hunting bring visitors from near and far. Rivers and lakes, uncommon in the Southwest, provide relief from heat across the forest.*

Current Conditions and Trends

- The majority of developed recreation facilities are in good condition.
- A large percentage of trails are in poor condition.
- Dispersed recreation sites vary in condition with popular areas being impacted by overuse.
- Due to budget limitations, the Gila NF has more recreation facilities and infrastructure than it can currently maintain.
- Public demand for recreation on the Gila NF is currently being met with the majority of user conflicts limited to specific areas.
- Scenic character on the Gila NF is natural appearing which is meeting the intent of scenery management.

Popular Developed Recreation Site at Quemado Lake

- 1,927 miles of trails
  - 1734 miles non-motorized
  - 193 miles motorized
- 182 developed recreation sites
  - 105 trailheads, etc.
  - 35 campgrounds
  - 5 picnic areas
- 135 recreation special use permits
  - 112 outfitter & guide
  - 8 recreation events
  - 8 commercial filming, etc.

Visitation Trends

Data from 2006 and 2011 National Visitor Use Monitoring Surveys

- Increased visitation - 514,000 visitors in 2011, 69% increase from 2006
- Trend in recreation activities from developed sites to dispersed recreation
- Hiking, hunting, and viewing natural features are the most popular activities
- Increased trends of local visitation (people living within 50 miles of the Forest)
- Increased visitation by individuals 60+ years old and decreased visitation by individuals less than 30 years old

Key Threats to Sustainability

Environmental Disturbances

- Flooding affecting developed recreation sites and trails
- Climate change increasing long term severe droughts which limits available water sources for hikers and affects water levels in streams and lakes
- Insects and disease increasing tree mortality
- Damages from fires
- Vegetation encroachment and erosion on trails in burned areas

Silver Fire Burning through Wright's Cabin

Flooding Damage at Kingston Campground

Silver Fire Approaching Emory Pass Vista

Deferred Maintenance Challenges

- Deferred maintenance of developed recreation facilities is valued at $437,547.
- Total annual operations and maintenance costs of recreation developed facilities is $1,347,408.
- Unsustainable trail system due to more miles of trail than can be maintained with over 60% budget decrease since 2012.
- Some recreation facilities and trails were poorly designed and located which increases maintenance cost and environmental impacts

Encroaching Vegetation on Trails

Trail Reconstruction within the Silver Fire

Litter at Developed Recreation Site

Cave Inventory

Fostering Greater Connection between People and Nature

- Continue to utilize volunteers, conservation organizations, partners, and agreements to accomplish quality work and look for ways to increase the utilization of these important resources
- Develop a unified Forest-wide interpretative and environmental education program
- Increase youth engagement to promote the importance of environmental stewardship
- Increase community involvement within the recreation program

Volunteers Working on Black Range Crest Trail

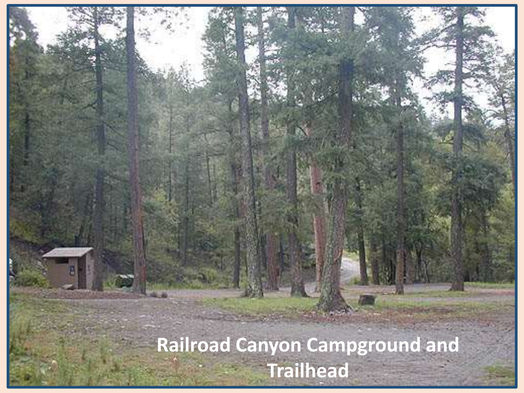
Conservation Corps Crew Completing Work on Trails Damaged by the Whitewater Baldy Complex Fire

Impacts to Program Management

- Overuse of popular developed sites while many remote developed sites are underutilized
- Increased vandalism and littering
- Increased budget constraints along with limited personnel
- Increased competition for popular camp locations in wilderness areas amongst outfitter and guides
- Changes in visitor use levels and trends in desired recreation opportunities
- Limited Forest-wide standards and strategies in managing special use permits, trails, developed recreation sites, caves, and designated areas which affects consistency

Risk

The ability of the Gila NF to continue to provide quality recreation opportunities that meet the needs of the public while protecting natural resource values for future generations is at risk of being unsustainable.



Railroad Canyon Campground and Trailhead

Needs For Change

There is a need for plan direction to address the long-term sustainability, changing trends in services, and intended use of recreation infrastructure, trails, and facilities.

There is a need to provide guidance for management of recreation activities and permitted special uses that occur in areas sensitive or at risk of resource degradation due to high visitation.

There is a need to include plan direction to implement management approaches to anticipate demand and minimize conflicts between uses.

There is a need to update existing plan direction and guidance to emphasize the importance of scenery and recreation opportunity effects when planning projects across all Forest program areas.

There is a need to provide plan direction for cave management since this is not addressed in the current Forest Plan.

There is a need to update plan direction for administration of the special uses program to be aligned with current National, Regional, and Forest policy direction.

There is a need to provide plan direction to balance consideration of special uses requests with impacts to natural resources, wilderness character, and other forest users.

Designated Areas

Current Designations

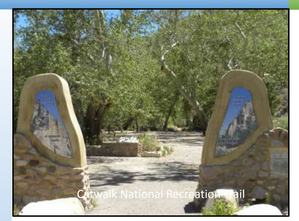
Designated areas are specific areas or features within the plan area that have been given a permanent designation to maintain its unique character or purpose.

Congressionally Designated Areas

- Three wilderness areas
- Two wilderness study areas
- One national scenic trail

Agency Administratively Designated Areas

- 29 inventoried roadless areas
- Eight listed eligible wild and scenic rivers
- One established, and four proposed, research natural areas
- Two national scenic byways
- Three national recreation trails
- Six species that have designated critical habitat


Catwalk National Recreation Trail

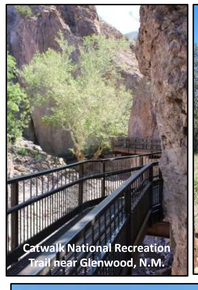
Trail of the Mountain Spirits National Scenic Byway

Continental Divide National Scenic Trail

Trail of the Mountain Spirits National Scenic Byway, Gallinas Canyon

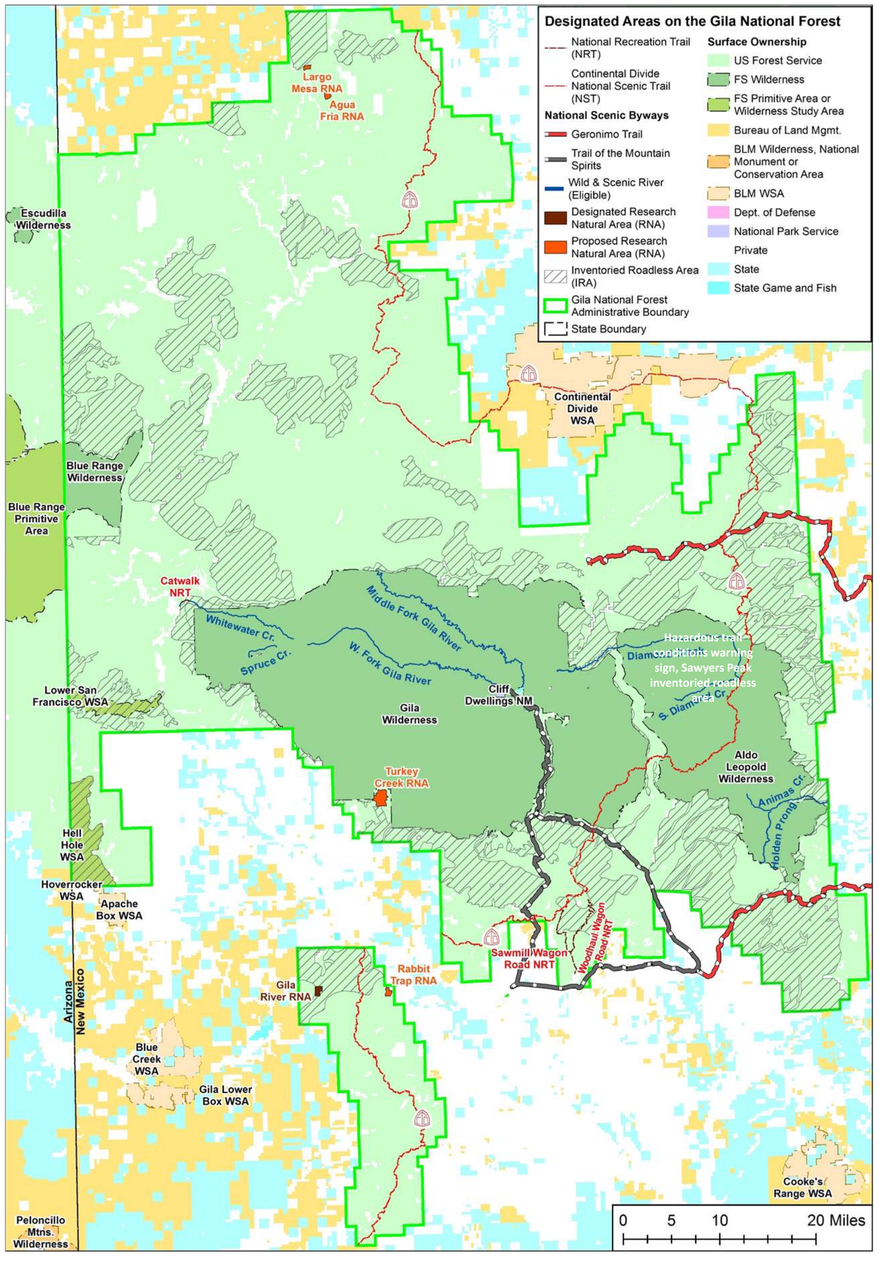
Hikers on the Continental Divide National Scenic Trail

Rain Creek Trail, Gila Wilderness


Catwalk National Recreation Trail near Glenwood, N.M.

Trail entering Aldo Leopold Wilderness Boundary

View across Lower Gila River inventoried roadless area to Turkey Creek recommended research natural area



Key Challenges to Sustainability of Designated Areas:

Wilderness

The three congressionally designated wilderness areas on the Forest are managed to protect wilderness character. Challenges to sustaining wilderness character include:

- Impacts to air quality and associated loss of visibility
- Military aircraft overflights
- Recreational mining activity
- Utility development near wilderness boundary
- The ecological effects of climate change
- Noxious weeds and invasive, non-native species
- Deteriorating trail conditions
- Management of outfitter/guides program
- User-created motorized routes and motorized incursions

Wilderness Study Areas

There are two congressionally designated wilderness study areas, managed to protect their wilderness characteristics. Challenges are similar to Wilderness, but include localized issues such as:

- Illegal firewood gathering within Hell Hole
- Saltcedar infestations with potential ecological impacts within Lower San Francisco River

Inventoried Roadless Areas

Inventoried Roadless Areas were established under the 2001 Roadless Area Conservation Rule. Challenges to sustaining Roadless values include:

- Noxious weeds and invasive, non-native species
- User-created motorized routes and accompanying motorized incursions

Continental Divide National Scenic Trail

The Continental Divide National Scenic Trail traverses the Rocky Mountains for 3,100 miles, including 254 miles of the Gila National Forest. Challenges to sustainability of the Trail are similar to other non-motorized trails:

- Illegal motorized use
- Effects of wildfires and floods
- Vandalism and theft of trail signs
- User created trails without proper design and erosion control, in locations susceptible to resource damage

National Recreation Trails

National recreation trails recognize exemplary trails of local and regional significance. The Gila contains the Catwalk, Sawmill Wagon Road, and Woodhaul Wagon Road National Recreation Trails. Challenges are similar to the Continental Divide and other non-motorized trails

Section of Powerhouse Trail completely washed away by a flooding event

Vandalism/theft of trail signage, Gila Wilderness

Trail damaged by post-wildfire flooding and debris flows, Little Dry Creek, Gila Wilderness

Eligible Wild and Scenic Rivers

There are no congressionally designated Wild & Scenic Rivers, but the Forest Plan provides direction to identify and protect eligible wild & scenic rivers for outstandingly remarkable values. Challenges include:

- User-developed motorized routes within river corridors
- Noxious weeds and invasive, non-native species
- Drought
- Uncharacteristic wildfires
- Post-wildfire flooding and erosion

Motorized use impacts to riparian zone of the Gila River

Vandalism to Trailhead Signage for a National Recreation Trail

Trail in the Sawyers Peak Inventoried Roadless Area affected by post-fire erosion, tread loss, and vegetation

Research Natural Areas

Research natural areas maintain natural conditions for biological diversity conservation, non-manipulative research, monitoring, and education. Challenges to sustaining research natural area qualities include:

- Potential upstream water development projects
- Existence of trails within a research natural area
- The presence of noxious weeds and invasive, non-native species are unknown, but may pose an additional threat

National Scenic Byways

There are two national scenic byways on the Forest. Challenges to scenic byways are similar to scenic character issues throughout the Forest:

- Natural disturbances such as insect epidemics and uncharacteristic wildfires
- New construction or updated facilities should meet the visual quality objectives

Needs For Change

There is a need to update plan direction for managing existing or potential new designated areas to maintain desired character and values unique to each area.

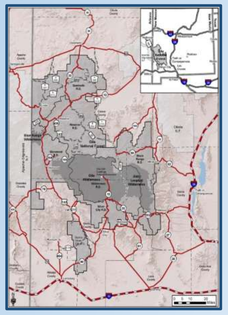
There is a need to update plan direction for the Continental Divide National Scenic Trail.

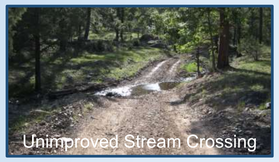
There is a need to update plan direction for determination of and implementation of wilderness use capacities for permitted outfitter/guide use within designated wilderness to allow for changing conditions and to align with current National, Regional, and Forest policy direction.

Infrastructure

Current Conditions and Trends

Major Access Routes




Unimproved Stream Crossing

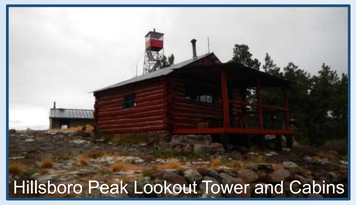
Bridge on Forest Road 150

Forest Transportation System

- 3,334 miles of designated system roads
- 12 road bridges; 11 of which have been in service for 50 years or more
  - Eight bridges are scheduled for replacement or rehabilitation as funding becomes available
  - Bridges are inspected every two years
- Six airstrips on the Forest receive semi-regular maintenance, two are managed by special use permit

Facilities

- There are six ranger district offices, one is combined with the supervisors office – all but two are agency owned
- There are several work centers and administrative facilities throughout the Forest
- There are many remote range cabins and barns that are owned by the Forest and are maintained by permittees
- There are ten active lookout towers


Hillsboro Peak Lookout Tower and Cabins

Administrative Facilities Condition Rating

Ranger District	Number of Structures	Good	Fair	Poor
Supervisor's Office	50	24	7	19
Black Range	43	15	3	25
Quemado	43	22	5	16
Glenwood	35	14	3	18
Wilderness	35	16	2	17
Reserve	43	19	6	18
Silver City	15	8	1	6
TOTAL	264	118	27	119

* For information on recreation facilities and trails – see recreation poster

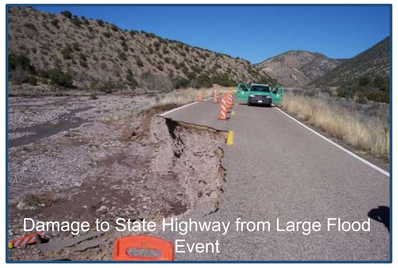
Other Infrastructure and Systems

- There are 15 drinking water systems which range from good to poor in condition. However, each drinking water system must meet water quality standards and receives regular testing to ensure standards are being met.
- Wastewater systems managed by the Forest include vault toilets, septic systems, and one lagoon with condition ratings ranging from good to poor
- There are a variety of utility distribution systems owned and maintained by public utilities or private companies that are administered under special use permits
- Range and wildlife developments can be found across the Forest and are typically maintained with help from permittees and partners

Key Challenges and Opportunities for Sustainability

Environmental Impacts

- Flooding damages to infrastructure
- Heavy rain events combined with high use on system roads causes a need for additional maintenance
- Seasonal weather patterns limit when and where maintenance can occur
- Deep snow may cause periodic road closures
- Impacts from fire events create:
  - Increased threat of post-fire flooding with large debris flows
  - Damage to structures and infrastructure


Damage to State Highway from Large Flood Event

Facility in Poor Condition

Damages from Post-Fire Flooding

Post-Fire Flooding

Consequences of Reduced Budgets Associated with Infrastructure

- Reduced ability to fully maintain system roads increases deferred maintenance
- Prioritizing facilities maintenance may decrease the condition rating of lower priority facilities
- Current plans for existing water systems are to correct issues and maintain a good condition rating; installation of any new water systems is discouraged
- It is likely that some infrastructure will deteriorate beyond repair, forcing decisions to consolidate and/or decommission

Flooding Damage to Remote Roads

Increased Deferred Maintenance

- Financial constraints that limit full maintenance increases the amount of deferred maintenance
- An estimate of deferred maintenance for Forest system roads is $272,265,429
- Deferred maintenance of administrative facilities is valued at over $7.3 million dollars
- Replacement of 17 vault toilets in poor condition is estimated to cost $680,000
- Deferred maintenance of septic/wastewater systems on the Forest is estimated at $300,000

Deferred Maintenance Work on Monument Park Cabin

Older Vault Toilet in Need of Replacement at Kingston Campground

Post-Fire Flooding Rehabilitation Work at Kingston Campground

Opportunities to Reduce Maintenance Cost

- Reduce overall footprint of facilities and consolidate resources in order to reduce maintenance costs
- Utilize leases for specialized facilities or locations (Grant County Airport, Black Range District, Silver City District/Supervisors Office)
- Share facilities and coordinate on improvements with different agencies (National Park Service, New Mexico Game and Fish Dept.) to share maintenance costs
- Upgrading the current radio communication system reducing the amount of needed maintenance
- Continue to utilize special use permittees to complete regular maintenance on infrastructure associated with their permit

Risk

The ability of the Forest to continue to maintain current facilities and infrastructure is at risk of being unsustainable. This could result in closure of infrastructure (i.e., motorized roads, administrative facilities, and campgrounds) and reduced access, recreation services, and enjoyment by the public. Deterioration of infrastructure (i.e., roads and utilities) could result in damage to the Forest.

Ecological, Social, and Economic Impacts

- Infrastructure that is properly designed, integrated within the landscape, and well maintained will contribute to sustainability
- Implementation of the Travel Management Rule will reduce cross country travel and user created roads reducing resource damage
- Limited funding for maintenance could result in site and infrastructure closures with negative economic and social impacts
- Roads that become impassable can increase user created roads

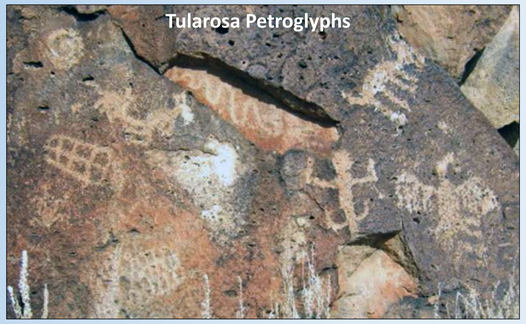
Needs For Change

There is a need for plan direction to ensure sustainable infrastructure (e.g., roads, trails, recreation and administrative facilities, range developments, maintenance, etc.).

There is a need to provide plan direction **for prioritized maintenance of the Gila's** National Forest System roads.

There is a need to update plan direction for decommissioning of closed roads.

Cultural & Historic Resources


Tularosa Petroglyphs

Cultural Resources

- 12,000 years of occupation and use
- 84% of sites associated with prehistoric occupation(s)
- Post-A.D. 1600 occupations at approximately 16% of sites
- Approximately 6,200 recorded sites
- Approximately 580,000 acres inventoried (17.1% of Forest)
- Only 12% of Forest inventoried to current standards
- Inventory primarily associated with projects (e.g., timber sales and prescribed burns)
- Site densities as high as 1 site per 12 acres in some areas
- 7 sites listed on the National Register of Historic Places (NRHP)
- 40% of sites have been evaluated for NRHP eligibility
- Of evaluated sites, approximately 50% are eligible to the NRHP
- Nine interpretive sites on the Gila National Forest focus on Cultural Resources

...A Shared Heritage

Archaeological sites within the Gila National Forest are a record of historic process and events important to the identity of local communities, the state of New Mexico, the region, and the Nation.

Trends, Vision & Management

Site after Wallow Fire (2011)

Site Conditions & Trends

- Water erosion is most prevalent impact observed at sites, impacting nearly 1/3 of all cultural resources
- Construction disturbance (including road construction, land development, mining, and logging) observed at 1/5 of all sites
- Bioturbation (including impacts from cattle, rodents, and other wildlife), impacts approximately 17% of sites
- Vandalism (including looting, defacement, and arson) noted at approximately 16% of sites
- Climate change poses an increased threat to sites, particularly in the form of uncharacteristic fire events and increased erosion

Prehistoric Puebloan room block with heavy fuel loading (A) and after fuel reduction treatments (B)

Ground penetrating radar work with the Denver Museum of Nature and Science assessing erosion concerns at a site in the Burro Mountains (left) and a pot eroding into a drainage on the Reserve Ranger District (right).

Fostering Greater Connection between People and Nature

- Contemporary uses of cultural resource and characteristics of the Gila National Forest by Native American, Hispanic, and Anglo-American traditional communities are critical to maintaining the identity of these communities
- Archaeological sites contain a wealth of information for scientific researchers, including information regarding ecological conditions and changes over the past twelve millennia, and human successes and failures in coping with these changes
- Archaeology helps connect people to the landscape through their sympathetic imagination of the lives and life ways of its inhabitants through time
- Cultural tourism is a significant component of the regional economy
- Volunteers and partnerships with research institutions (e.g., universities) further research and stewardship of our cultural resources

UNLV Students & Volunteers Excavating Elk Ridge Pueblo

NMSU Students & Volunteers Excavating South Diamond Pueblo

Scorpion Cliff Dwelling

Needs For Change

- There is a need for updating plan direction to stabilize, preserve, interpret, and protect historic and sensitive properties (e.g., archaeological sites, historic structures, and traditional cultural properties).
- There is a need for plan direction that recognizes the inherent value and preservation of Native American traditional cultural properties and sacred sites, as well as non-Native American traditional cultural properties, while maintaining the anonymity of such sites where appropriate.
- There is a need for desired conditions in the plan that address the alignment of heritage resource management objectives (the management of historic properties and landscapes, sacred sites, contemporary uses) with other resource management objectives (particularly but not limited to ecosystem restoration).

Mogollon Baldy Lookout Tower

Areas of Tribal Importance

Traditional Uses

Mogollon Mountains

Lands managed by the Gila National Forest have been used, and continue to be used, by many tribes for a variety of traditional cultural and religious activities. Over time, these activities have included, but are not limited to: collection of plants, stone, minerals, pigments, feathers, soil, catching eagles, hunting game, and conducting religious pilgrimages to place offerings and to visit shrines and springs.

Places and properties valued and used by the tribes for a variety of purposes have been identified on every District of the Gila National Forest. Properties can possess traditional cultural or religious significance for a number of reasons. Some of these reasons include locations with long-standing cultural use, locations of buried human remains repatriated under NAGPRA, locations where ceremonial objects have been retired, locations of contemporary ceremonies, and locations where specific forest products are gathered for ceremonial use. Some locations such as shrines, springs, caves, and resource collection areas have long-standing and ongoing historical, cultural, and religious significance.

In addition to specific noted locations, peaks and entire mountain ranges are frequently regarded as sacred, and viewed as an integral part of a tribe's cultural landscape. Multiple peaks on the Forest have been identified as sacred to one or more tribes. Many have place names tied to tribes' oral traditions. Cultural and traditional use of specific mountains is ongoing, dictated by the cycle of cultural activities.

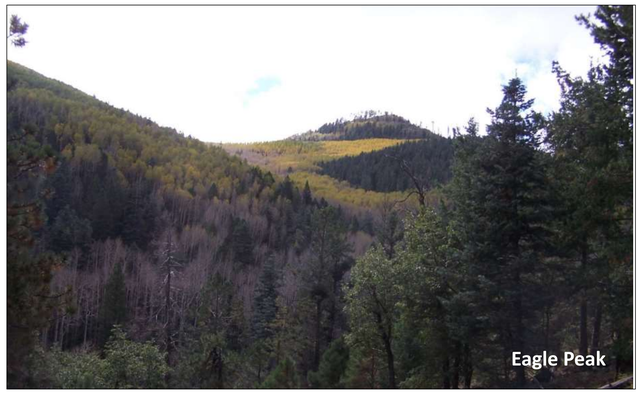
Existing information regarding sacred sites is based on published sources as well as the results of project-level consultation conducted by the Forest. To date, approximately 30 locations of cultural and religious significance have been identified Forest-wide.

Tularosa

Apache Creek

Condition and Vision

The Zuni Cultural Resource Advisory Team and GNF staff visiting a rock art site on the Gila National Forest


Eagle Peak

Conditions and Trends

- Changes in land ownership has and can restrict or eliminate access to culturally significant locations
- Degradation of forest health and watershed conditions is of concern to tribes and offers an opportunity to work together on landscape scale restoration projects
- Climate change can lead to environmental degradation that has the potential to change the character of sacred places and the availability of traditionally used resources
- Forests, with large land bases, may prove somewhat more resilient to climate change and National Forests may become increasingly important sources of forest products for tribes
- Changing technology and energy development has the potential to affect areas of tribal importance through a variety of activities, such as the development of communication sites, mineral exploration and extraction, and construction and maintenance of transmission or utility corridors
- Visual and disruptive activities can interfere with traditional and religious practices
- With population growth and expanding recreational use, conflicts between traditional practitioners and other Forest visitors could increase
- Development of private inholdings and land adjacent to the Forest can affect characteristics significant to tribes

Consultation

The Gila National Forest routinely consults with 10 federally recognized tribes that are based in New Mexico, Arizona, Oklahoma, and Texas. These tribes include: the Pueblos of Acoma, Laguna, Zuni, Ysleta Del Sur Pueblo, the Navajo Nation, the Hopi Tribe, the San Carlos Apache Tribe, the Ft. Sill Apache Tribe, the Mescalero Apache Tribe, and the White Mountain Apache Tribe.

Strategic Vision

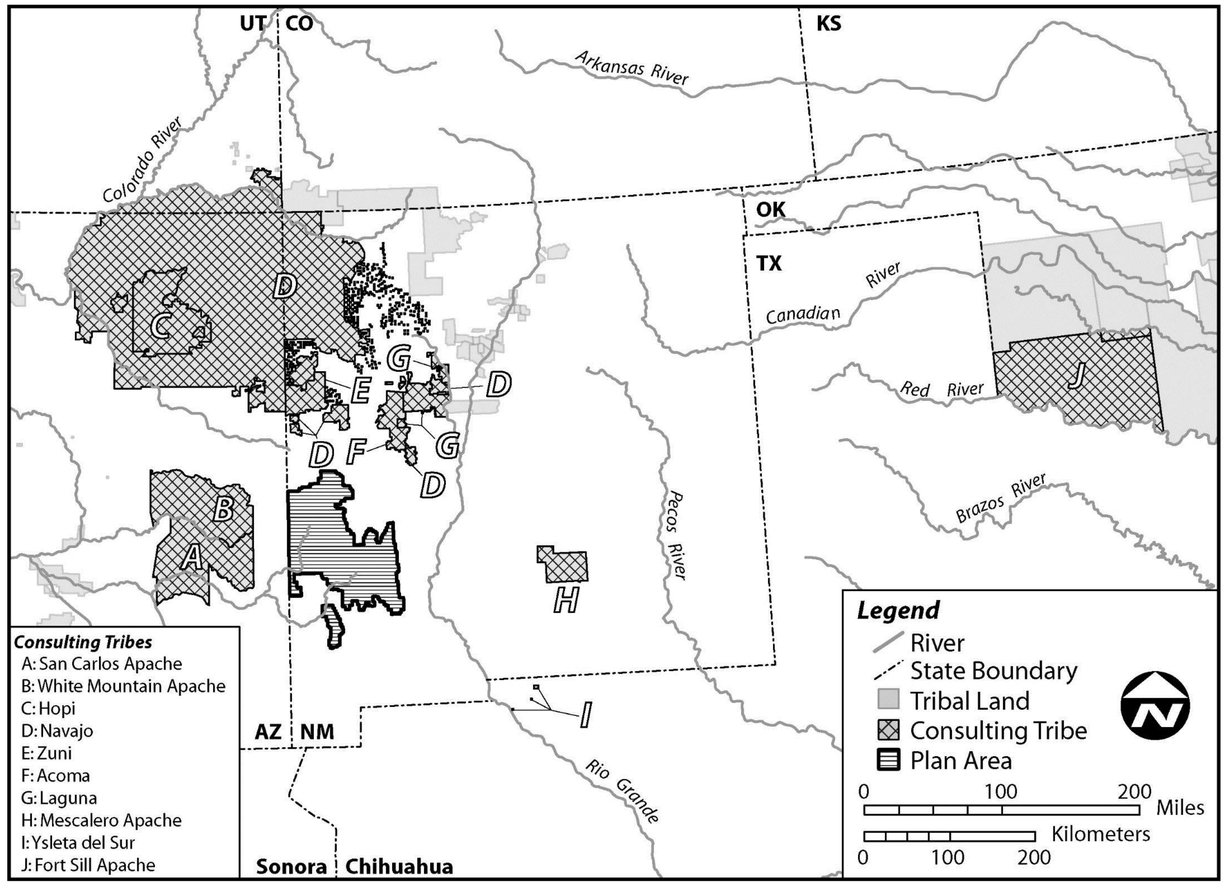
The U.S. Forest Service Tribal Relations Strategic Plan (2010) outlines three basic goals around Tribal Rights, Partnerships and Program Development:

- American Indian and Alaska Native Rights: Ensure the agency redeems its trust responsibility and protects American Indian and Alaska Native reserved rights as they pertain to Forest Service programs, projects, and policies.
- Partnerships: Leverage partnerships to maximize mutual success.
- Program Development: Promote integration and utility of the Tribal Relations Program throughout the agency.

Needs for Change

Environmental and cultural conditions are influencing tribal use of the Forest. However, within these challenges there is also room for optimism. Despite being located a distance from tribal populations, programs are being established (by tribes with Forest participation) which bring youth onto the Forest to reconnect with traditional lands. Landscape restoration provides an opportunity for tribes and the Forest Service to work together towards common goals. The Forest strives to build and strengthen relationships with tribes and hear and incorporate tribal input into a broad range of activities.

- There is a need to update plan direction on giving consideration to the value and importance of areas that may be identified as a sacred site or part of an important cultural landscape by tribes
- There is a need for management approaches that include opportunities for integrating forest management with tribal needs through shared stewardship.



Next Steps

- Your feedback on the draft assessment report is most useful if received before November 15
- Your input on the draft needs-for-change statements is most useful if received before November 30
- You can submit feedback using the provided forms and dropping off in the comments box this evening, or take forms home and email, mail, or drop off at one of the District Offices
- The Forest will consider feedback and revise these draft documents before finalizing

Then…

Publish a notice of intent to revise the forest plan in the *Federal Register*, which will begin the next phase of the planning process.

Thank you for your participation and for your future engagement in developing the revised Gila Forest Plan

For more information, please visit our website at http://go.usa.gov/h88k