

## **Research Natural Areas Evaluation**

### **Coconino National Forest – Forest Plan Revision Documentation**

#### **Background:**

Research Natural Areas (RNAs) are considered a type of Special Area, which are places or areas within the National Forest System designated because of their unique or special characteristics (FSM 1905 – Definitions). These designations may occur because of Congressional action, through statute, or through separate administrative processes. The Coconino National Forest Land Management Plan has administratively designated special areas, such as RNAs, botanic areas, and geologic areas.

Research Natural Areas are defined as *“physical or biological units in which current natural conditions are maintained insofar as possible. These conditions are ordinarily achieved by allowing natural physical and biological processes to prevail without human intervention. Research Natural Areas are principally for non-manipulative research, observation, and study (FSM 4063). They are designated to “maintain a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and natural situations that have scientific interest and importance that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity” (FSM 4063.02).*

Special Area recommendations are part of the Forest Plan. RNAs, as types of special areas must be supported by the desired conditions and other plan components developed in the revised forest plans. During Forest Plan Revision it is appropriate to evaluate conditions and management direction for established RNAs or the disestablishment of existing RNAs. Any recommendations for designation of new, or previously proposed RNAs may be made during revision (36 CFR 2197(a)(2)(v)). (Note: Formal RNA establishment and projects or activities in RNAs would have to be handled in a subsequent site-specific establishment report and NEPA process.) (Figure 1).

The R3 Research Natural Area Process for Forest Plan Revision under the 1982 Planning Rule Provisions workgroup product (United States Forest Service Southwestern Region RNA Work Group 2009) was used to complete this evaluation. An interdisciplinary team of Coconino National Forest staff provided the information necessary to complete the evaluation.

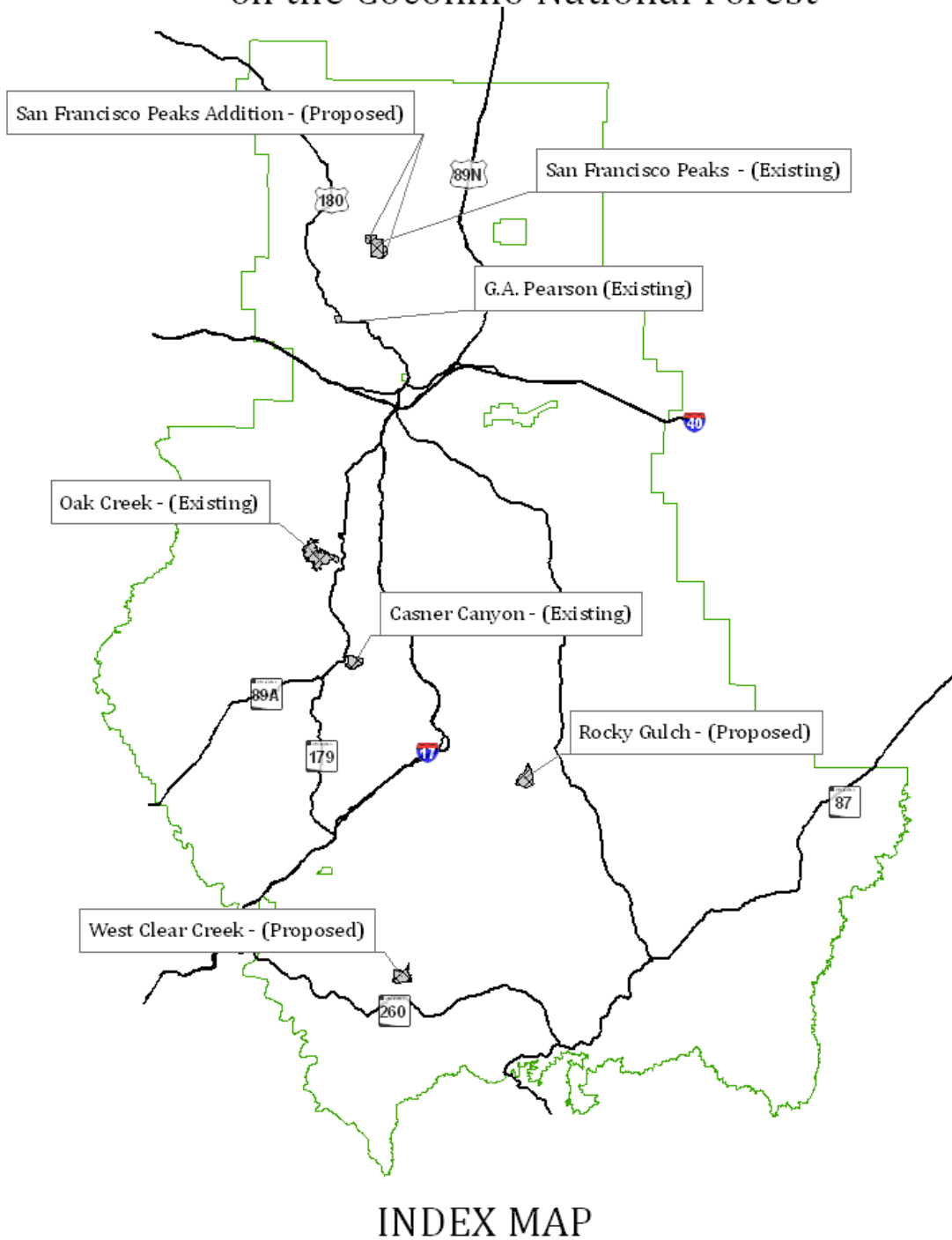
Standards for protection and management of a Research Natural Area must support and promote the basic objectives and purposes of establishing the area. Ensure that the establishment record clearly states the objectives for establishing the area and identifies the special values for which

the area is being recognized (FSM 4063.41). In addition, comply with the standards described in paragraphs 1-7:

***4063.3 - Protection and Management Standards***

1. Ecological Processes. The prime consideration in managing Research Natural Areas is maintenance of natural conditions and processes. To the extent practicable, protect Research Natural Areas against human activities that directly or indirectly modify the integrity of the ecological processes.
2. Logging and Wood Gathering. Do not permit logging or wood gathering activities in Research Natural Areas unless required for restoration of an area to natural conditions.
3. Livestock. In Research Natural Areas where livestock grazing is not part of the management prescription, the Regional Forester and Station Director have the responsibility, as appropriate, to establish a level of acceptable casual or incidental livestock use that can be tolerated and is consistent with the management prescription for the Research Natural Area (4063.04b). Where grazing is needed to establish or maintain vegetative communities, define objectives for grazing.
4. Exotic Plants and Animal Life. Remove exotic plants or animals to the extent practicable. Where pest management activities are prescribed, they shall be as specific as possible against target organisms and induce minimal impact to other components of the ecosystem. The release of biological control organisms for exotic species control should be carefully considered to avoid the introduction of other exotic species.
5. Recreational Use. Recreational use should be restricted or prohibited if such use threatens or interferes with the objectives or purposes for which the Research Natural Area is established.
6. Special Orders. Where special orders are needed to limit, restrict, or control specific activities such as camping, seasons of use or other uses, that are not compatible with the objectives of the Research Natural Area, the Forest Supervisor issues orders pursuant to 36 CFR Part 261, Subpart B, to protect an area's features. Any such orders shall incorporate the special closure provisions of 36 CFR 261.53. (See FSM 5353 for penalties applicable to violations of orders.)
7. Roads, Trails, Fences, Signs, or Buildings. Do not permit new roads, trails, fences, or signs on an established Research Natural Area unless they contribute to the objectives or to the protection of the area. Boundary fencing is permitted for protection against livestock or excessive human use. Buildings are not permitted. In rare instances, temporary gauging stations and instrument shelters may be desirable. Follow procedures set forth at FSM 4063.31 for authorizing temporary physical improvements.

## Proposed and Existing Research Natural Areas on the Coconino National Forest



**Figure 1: Coconino National Forest Existing RNA and Proposed RNA locations.**

## Existing RNAs

There are four existing RNAs on the Coconino National Forest:

1. Casner Canyon RNA: Located near Sedona and within Oak Creek Canyon. The area contains a pure stand of Arizona cypress along with some chaparral. This area was established in 1973 and contains 609 acres.
2. Oak Creek RNA: Located on the West Fork of Oak Creek in the Red Rock Secret Mountain Wilderness. The area contains a wide variety of forest and shrub species, including Douglas-fir, Ponderosa Pine, and Interior Chaparral (including Mountain Mahogany/Oak Scrub). This area was established in 1937 and contains 1,853 acres.
3. San Francisco Peaks RNA: Located on the northwest side of the San Francisco Peaks within the Kachina Peaks Wilderness. The area represents a stand of pure Engelmann Spruce and Bristlecone Pine. The area was established in 1931 and is 1,010 acres.
4. G.A. Pearson RNA: Located just north of Flagstaff in a portion of the Fort Valley Experimental Forest (Rocky Mountain Research Station). The area represents a pure stand of old growth ponderosa pine. This area was established in 1950 and is 150 acres. As this area is managed as an Experimental Forest by Rocky Mountain Research Station, management decisions are not made through this Forest Plan (see Forest Plan Replacement Page 193). Therefore, this area is not evaluated further.

Table 1 (A-C) shows the Review of RNA Management Direction for the existing RNAs.

## Potential RNAs

There are three previously proposed RNAs evaluated in this report. These were never formally established as RNAs but have been managed, for the most part, as if they were formally designated. Modifications to the original proposals have been made through the plan revision process to increase the quality of the potential RNA and reduce conflicts with other uses.

1. West Clear Creek: Located in the West Clear Creek Wilderness. ***The original location proposed is not reasonable because of increased recreation impacts.*** The area ***proposed in this document*** contains Pinyon-Juniper Evergreen Shrub, Mixed Broadleaf Deciduous Riparian Forest, and a perennial stream. It is 769 acres.
2. San Francisco Peaks Additions: Located in the Kachina Peaks Wilderness, adjacent to the San Francisco Peaks RNA. The Westside Extension (144 acres) contains Bristlecone Pine and the Eastside Extension (135 Acres) contains Alpine Tundra, rare features in the Southwestern Region.
3. Rocky Gulch: Originally proposed in the 1987 Forest Plan, this RNA is located in the Beaver Creek Watershed. The area contains 926 acres of un-logged ponderosa pine forest.

Table 2 (A-C) shows the Review of Representative Ecological conditions for the ***potential*** RNAs.

<b>Table 1A: Review of Existing RNA Management Direction - Casner Canyon RNA</b>		
<b>Criteria</b>	<b>YES</b>	<b>NO</b>
<p>1. Does current Forest Plan management direction protect this RNA against human-caused environmental disruptions in this RNA?</p> <p>a. What are some of the threats that may affect this RNA? Motorized use? Trespass? Mineral exploration or development? Mineral withdrawal?</p> <p>b. Emerging recreational uses (examples: rock climbing, mountain bike use, increased vegetation loss/disturbance from camping, primary and social trails, previously proposed requests for public cabin or backcountry hut use, increasing uses that require a degree of infrastructure, if only temporary (corrals, livestock highlines)? Note: If an area has been used for livestock grazing, it is not necessarily eliminated from RNA inclusion. What needs to be determined is how grazing has affected the values that are being considered for the area's inclusion as an RNA (FSM 4063.3.3).</p>	<p><i>The Forest Plan contains the following direction:</i></p> <p>Protect natural ecological conditions, Visual Quality Objectives of Preservation, timber harvest prohibited, off-road travel prohibited, recreation is not promoted and camping and campfires are prohibited.</p>	<p><i>Potential Threats:</i></p> <p>There are two new illegal trails that have been created for mountain biking and hiking in the RNA.</p>
<p>2. Does the RNA continue to be managed as a physical or biological unit in which current natural conditions are maintained to the extent possible? These conditions are ordinarily achieved by allowing natural physical and biological processes to prevail without human intervention. However, under unusual circumstances, deliberate manipulation may be utilized to maintain the unique feature that the Research Natural Area was established to protect.</p>	<p>Yes. Natural effects of drought and beetle infestation have affected this area. May have long term effects on Arizona Cypress regeneration if drought continues.</p>	<p>Arizona Cypress is a fire-adapted species and fire has been excluded from this RNA because it is in an urban-interface area.</p>
<p>3. Are natural physical and biological processes being allowed to prevail without human intervention in the RNA? However, under unusual circumstances, deliberate manipulation may be utilized to maintain the unique feature that the Research Natural Area was established to protect.</p>	<p>Yes, except that fire suppression is occurring in the general area because of values-at-risk in Oak Creek Canyon.</p>	
<p>4. What is the current status of mineral entry for this RNA? Failure to withdraw an area from mineral entry should not be viewed as a deterrent to selection and establishment of a desirable Research Natural Area (FSM 4063.35).</p>	<p>Withdrawn from locatable and leasable mineral entry (Forest Plan Amendment 12 page 196-2). Within the Oak Creek Canyon Recreation Area mineral withdrawal (Public Land Order 7387) - effective date was May 3, 1999 (valid for 20 years)</p>	

<b>Table 1B: Review of Existing RNA Management Direction - Oak Creek RNA</b>		
<b>Criteria</b>	<b>YES</b>	<b>NO</b>
<p>1. Does current Forest Plan management direction protect this RNA against human-caused environmental disruptions in this RNA?</p> <p>a. What are some of the threats that may affect this RNA? Motorized use? Trespass? Mineral exploration or development?</p> <p>b. Emerging recreational uses (examples: rock climbing, mountain bike use, increased vegetation loss/disturbance from camping, primary and social trails, previously proposed requests for public cabin or backcountry hut use, increasing uses that require a degree of infrastructure, if only temporary (corrals, livestock highlines)? Note: If an area has been used for livestock grazing, it is not necessarily eliminated from RNA inclusion. What needs to be determined is how grazing has affected the values that are being considered for the area's inclusion as an RNA (FSM 4063.3.3).</p>	<p><i>The Forest Plan contains the following direction:</i> Protect natural ecological conditions, Visual Quality Objectives of Preservation, timber harvest prohibited, vehicular travel is prohibited, recreation is not promoted, camping is restricted and campfires are prohibited. Wild and Scenic River eligible and ecology, geology, and riparian have been identified as Outstanding Remarkable Values to be preserved.</p>	<p><i>Potential threats:</i> Recreational use is high and increasing on the West Fork and impacts the first mile into the RNA along the trail/creek.</p> <p>Recreation is one of the Outstanding Remarkable Values for Wild and Scenic River eligibility.</p> <p>Invasive plants – including bull thistle, Himalayan Blackberry, and Brome species.</p>
<p>2. Does the RNA continue to be managed as a physical or biological unit in which current natural conditions are maintained to the extent possible? These conditions are ordinarily achieved by allowing natural physical and biological processes to prevail without human intervention. However, under unusual circumstances, deliberate manipulation may be utilized to maintain the unique feature that the Research Natural Area was established to protect.</p>	<p>Yes. This RNA is in a Wilderness Area. Both Oak Creek and West Fork of Oak Creek are designated as Outstanding AZ Waters (formerly Unique waters).</p>	<p>Pesticide application is a human intervention; however, it is aimed to enhance the native conditions and aquatic species. This is not the unique feature that the RNA was established to protect, but it is an important ecological feature of the area.</p> <p>There has also been some treatments of invasive plants but none have used herbicides.</p>
<p>3. Are natural physical and biological processes being allowed to prevail without human intervention in the RNA? However, under unusual circumstances, deliberate manipulation may be utilized to maintain the unique feature that the Research Natural Area was established to protect.</p>	<p>Forest Plan says suppression tactics should minimize damage to character of RNA.</p>	<p>Current Forest Plan effectively prevents fire management in Wilderness and thus the area has experienced fire suppression.</p>
<p>4. What is the current status of mineral entry for this RNA? Failure to withdraw an area from mineral entry should not be viewed as a deterrent to selection and establishment of a desirable Research Natural Area (FSM 4063.35).</p>	<p>Withdrawn. Within the Red Rock-Secret Mountain Wilderness Area (established 1984).</p>	

<b>Table 1C: Review of Existing RNA Management Direction - San Francisco Peaks RNA</b>		
<b>Criteria</b>	<b>YES</b>	<b>NO</b>
<p>1. Does current Forest Plan management direction protect this RNA against human-caused environmental disruptions in this RNA?</p> <p>a. What are some of the threats that may affect this RNA? Motorized use? Trespass? Mineral exploration or development?</p> <p>b. Emerging recreational uses (examples: rock climbing, mountain bike use, increased vegetation loss/disturbance from camping, primary and social trails, previously proposed requests for public cabin or backcountry hut use, increasing uses that require a degree of infrastructure, if only temporary (corrals, livestock highlines)? Note: If an area has been used for livestock grazing, it is not necessarily eliminated from RNA inclusion. What needs to be determined is how grazing has affected the values that are being considered for the area's inclusion as an RNA (FSM 4063.3.3).</p>	<p><i>The Forest Plan contains the following direction:</i></p> <p>Protect natural ecological conditions, Visual Quality Objectives of Preservation, timber harvest prohibited, off-road travel prohibited, grazing capacity is not assigned because of steep slopes, recreation is not promoted. Wilderness protections and plan direction also applies here.</p>	<p><i>Potential Threats:</i></p> <p>Occasional dispersed recreation.</p> <p>Alpine tundra, the vegetation type for which the area is designated, is expected to move up in elevation as a result of climate change. It may be a diminishing portion of the area as a result.</p>
<p>2. Does the RNA continue to be managed as a physical or biological unit in which current natural conditions are maintained to the extent possible? These conditions are ordinarily achieved by allowing natural physical and biological processes to prevail without human intervention. However, under unusual circumstances, deliberate manipulation may be utilized to maintain the unique feature that the Research Natural Area was established to protect.</p>	<p>Yes. This RNA is in a Wilderness Area and in a vegetation type with a low frequency fires regime.</p>	
<p>3. Are natural physical and biological processes being allowed to prevail without human intervention in the RNA? However, under unusual circumstances, deliberate manipulation may be utilized to maintain the unique feature that the Research Natural Area was established to protect.</p>	<p>Wildfire has historically been suppressed in this area but it is still within its historic range of variability.</p>	
<p>4. What is the current status of mineral entry for this RNA? Failure to withdraw an area from mineral entry should not be viewed as a deterrent to selection and establishment of a desirable Research Natural Area (FSM 4063.35).</p>	<p>Within the Kachina Peaks Wilderness (established 1984) and the San Francisco Peaks / Mount Elden Recreation Area mineral withdrawal (Public Land Order 7467) - effective date was October 16, 2000 (valid for 20 years)</p>	

<b>Table 2A: Review of Representative Ecological Conditions - West Clear Creek Potential RNA</b>		
<b>Criteria</b>	<b>YES (state justification)</b>	<b>NO (state justification)</b>
<b>Review RNA Representative Assessment Spreadsheet</b>		
<ul style="list-style-type: none"> <li>Are there areas on your Forest that contain the PNVТ classes that fall into the 2 or 3 rankings for low representation for a particular PNVТ class?</li> <li>Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?</li> <li>If you have previously proposed RNAs in your current Forest Plan, do they fall within PNVТ classes with rankings of 2 or 3?</li> </ul>	<p>The PNVТ of the area is PJ Evergreen Shrub (representation ranking: 2) and Mixed Broadleaf Deciduous Riparian Forest (ranking: 1). There are hanging gardens and springs on the canyon walls that provide unique vegetative communities. The canyon is also an example of a riparian area with a frequent high volume flooding regime.</p>	<p>The aquatic habitat has many nonnative species present, including nonnative trout and crayfish.</p>
<b>Use the Conditions listed below to determine if these low-representative PNVТ class areas or aquatic habitats are appropriate for RNA establishment</b>		
Area contributes to a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, aquatic habitats, and natural situations of scientific interest and importance that in combination form a national network of ecological areas for research, education, and maintenance of biological diversity. RNA represents a specific vegetation type or ecosystem as identified by the Regional ecological RNA evaluation.	<p>The riparian area supports an outstanding closed canopy, deciduous broadleaf forest, The site is noteworthy for the diversity of tree species present in the area, including cottonwoods, willows and Arizona walnut.</p>	
Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species.	<p>Yes, Roundtail Chub (a candidate for ESA listing) is present now. There is possibly Headwater Chub (another candidate species). Sonora and desert sucker and Longfin dace (sensitive species) are present.</p>	<p>It is proposed critical habitat for the three threatened species, Gila trout, Spikedace and Loach minnow but they are not present because of invasive species and we may not be able to reintroduce them given restrictions of wilderness</p>



<b>Table 2A: Review of Representative Ecological Conditions - West Clear Creek Potential RNA</b>		
<b>Criteria</b>	<b>YES (state justification)</b>	<b>NO (state justification)</b>
Area serves as a baseline or reference area for the study of long-term ecological processes such as disturbance, hydrologic processes, climate change, or other processes.	Yes, the area is self contained in a Wilderness Area.	The aquatic system has been altered by the invasion of non-natives. The whole of West Clear Creek has 13 non-native aquatic species. In addition, fire suppression and the Forest Plan policy of no fire use in Wilderness have altered long term ecological processes. The area is also accessible for wilderness recreation and the use of the area for backpacking and canyoneering is increasing.
Area serves as a control area for comparing results from manipulative research.	Yes, this area has a riparian community with flooding disturbance regime intact. The PJ evergreen shrub community is a reference in that it has not been disturbed by mechanical vegetation management.	Fire suppression has lead to unnaturally high fuel loading in PJ Evergreen shrub vegetation on the slopes.
Area boundaries encompass an area large enough to provide essentially unmodified conditions within their interiors, which are necessary in accordance with the objectives stated in the establishment record (FSM 4063.02), and to protect the ecological processes, features, and/or qualities for which the RNA was established. Although not required, entire small drainages are ideal because they maintain interrelationships of terrestrial and aquatic systems.	Yes, the proposed RNA is 1,007 acres and contains portions of several small drainages.	However, the proposed RNA is influenced by what happens upstream in the ecosystem and in the watersheds that feed the side drainages. Most recreation use occurs in the stream corridor. A few camping sites exist along the river and on the bench on the north side of the RNA.
Area shows little or no evidence of major disturbances by humans. Activities, such as livestock grazing and other uses have not had affected area beyond ability to recover. No evidence of timber cutting in past 50 years.	No timber cutting has occurred in the area. Livestock grazing has not affected the area beyond its ability to recover.	The area is an important section of the wilderness for recreation because it provides access to the backcountry which has the best opportunities for solitude and challenge.
Area reflects its original, near-pristine condition <i>as closely as possible</i> .		Fire exclusion has altered the ecological processes.

<b>Table 2A: Review of Representative Ecological Conditions - West Clear Creek Potential RNA</b>		
<b>Criteria</b>	<b>YES (state justification)</b>	<b>NO (state justification)</b>
The best available, qualified area was chosen. In certain geographic regions and in certain community types, it may be impossible to find candidate areas that do not contain exotic plant or animal life.	Yes, a similar area was proposed in the last planning effort but due to increased recreation pressure, it was not longer a reasonable candidate. The new area proposed is only used by backcountry recreation users and anglers. This lower and less intense recreation is more appropriate in an RNA.	

***Other considerations for RNA Establishment***

*Prior and Ongoing Research:* No known research in this area.

*Ongoing Uses:* West Clear Creek Wilderness has increasing recreation use, especially people seeking solitude and challenge who have been displaced from Fossil Creek because of increased recreation use there. Most recreation is along the riparian corridor and in slot canyons further into the wilderness. The first mile from the trailhead on the west side is heavily used and the rest of the area has low but consistent recreation use. It would be impractical to meet the standard policy for a RNA to limit or prohibit recreation use in the area as described in FSH 4063.3 - Protection and Management Standards. However, this use may be acceptable in a RNA of this type because regular flooding may remove evidence of recreation activities.

“West Clear Creek supports a diverse riparian habitat and the stream reaches being considered for a Research Natural Area (RNA) are not currently being impacted by recreation to the degree that most streams in Arizona are. A large portion of the riparian community showed a significant alder composition but also had sycamore, Fremont Cottonwood, Narrow-leaf cottonwood and Arizona Walnut. The Cottonwood and Arizona Walnut trees were associated predominately with the hanging gardens and were not a significant part of the riparian composition. Yet the presence is important and worth noting.

Water quality seemed very good with little to no signs of embeddedness and a diverse macroinvertebrate community that included cadis flies and other good indicators of healthy water quality conditions. Stream bank stability was very stable and seemed to be aided by the abundance of deergrass found along the stream banks. Overall a healthy and diverse riparian tree community, clean water and a

stable stream system make this riparian reach a good candidate for a Research Natural Area.”- Amina Sena, District Hydrologist-Red Rock Ranger District

<b>Table 2B: Review of Representative Ecological Conditions - San Francisco Peaks Addition West and East side Potential RNA Extensions</b>		
<b>Criteria</b>	<b>YES (state justification)</b>	<b>NO (state justification)</b>
<b>Review RNA Representative Assessment Spreadsheet</b>		
<ul style="list-style-type: none"> <li>Are there areas on your Forest that contain the PNV T classes that fall into the 2 or 3 rankings for low representation for a particular PNV T class?</li> <li>Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?</li> <li>If you have previously proposed RNAs in your current Forest Plan, do they fall within PNV T classes with rankings of 2 or 3?</li> </ul>	East Side Extension is Alpine Tundra(3) and Spruce Fir (1). No aquatics. Bristlecone pine is a rare and notable species for this area.	No, West Side extension is mostly Spruce fir (1), montane/Subalpine Grassland (1). No aquatics, therefore it doesn't meet the primary criteria for an RNA and was removed from further review.
<b>Use the Conditions listed below to determine if these low-representative PNV T class areas or aquatic habitats are appropriate for RNA establishment</b>	<b>State reason why the area <u>meets</u> the criterion</b>	<b>State reason why the area <u>does not meet</u> the criterion</b>
Area contributes to a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, aquatic habitats, and natural situations of scientific interest and importance that in combination form a national network of ecological areas for research, education, and maintenance of biological diversity. RNA represents a specific vegetation type or ecosystem as identified by the Regional ecological RNA evaluation.	Yes, The East Side Extension is a good quality representative area of Alpine Tundra and this is the only Alpine Tundra in AZ. The West side extension has bristlecone pine stands.	
Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species.	Yes, there is one Threatened and Endangered Plant Species , and 13 forest analysis species that are associated with Alpine Tundra.	
Area serves as a baseline or reference area for the study of long-term ecological processes such as disturbance, hydrologic processes, climate change, or other processes.	Yes, this area will be a good baseline area for study.	
Area serves as a control area for comparing results from manipulative research.	Yes, the area can serve as a reference area.	
Area boundaries encompass an area large enough to provide essentially unmodified conditions within their interiors, which are necessary in accordance with the objectives stated in the establishment record (FSM 4063.02), and to protect the ecological processes, features, and/or qualities for which the RNA was established. Although not required, entire small drainages are ideal because they maintain interrelationships of terrestrial and aquatic systems.	Yes, the east side extension will be a good addition to protect the ecological processes of the existing RNA considering the anticipated changes to the ecosystem from climate change.	

**Table 2B: Review of Representative Ecological Conditions - San Francisco Peaks Addition West and East side Potential RNA Extensions**

<b>Criteria</b>	<b>YES (state justification)</b>	<b>NO (state justification)</b>
Area shows little or no evidence of major disturbances by humans. Activities, such as livestock grazing and other uses have not had affected area beyond ability to recover. No evidence of timber cutting in past 50 years.	Yes, no major disturbances. There is an active allotment up there grazing has not occurred for many years. The east side addition may be within the area excluded from the allotment.	
Area reflects its original, near-pristine condition <i>as closely as possible</i> .	Yes	
The best available, qualified area was chosen. In certain geographic regions and in certain community types, it may be impossible to find candidate areas that do not contain exotic plant or animal life.	Yes, there would be problems with selecting other alpine areas on the other side of the peaks due to high levels of recreational use.	

***Other considerations for RNA Establishment***

*Prior and Ongoing Research:* The San Francisco Peaks has a long history of botanical inventory and research. It is unknown which of the following are within the RNA or the potential extensions:

1941: Plant inventory: E.L. Little

1983: Plant inventory: Rominger and Paulik

Date unknown: Plant inventory: Will Moir

1970: Bristlecone pine phenology study

1983: San Francisco Peaks groundsel listed as threatened. Permanent monitoring plots established. These plots are periodically read by research personnel.

*Ongoing Uses:* There are occasional intrusions from recreation users but off-trail recreation use is prohibited in this area by the Forest Plan.

<b>Table 2C: Review of Representative Ecological Conditions - Rocky Gulch Potential RNA</b>		
<b>Criteria</b>	<b>YES (state justification)</b>	<b>NO (state justification)</b>
<b>Review RNA Representative Assessment Spreadsheet</b>		
<ul style="list-style-type: none"> <li>Are there areas on your Forest that contain the PNVT classes that fall into the 2 or 3 rankings for low representation for a particular PNVT class?</li> <li>Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?</li> <li>If you have previously proposed RNAs in your current Forest Plan, do they fall within PNVT classes with rankings of 2 or 3?</li> </ul>	Yes, the major PNVT is Ponderosa Pine (2). No Aquatics.	
<b>Use the Conditions listed below to determine if these low-representative PNVT class areas or aquatic habitats are appropriate for RNA establishment</b>	<b>State reason why the area <u>meets</u> the criterion</b>	<b>State reason why the area <u>does not meet</u> the criterion</b>
Area contributes to a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, aquatic habitats, and natural situations of scientific interest and importance that in combination form a national network of ecological areas for research, education, and maintenance of biological diversity. RNA represents a specific vegetation type or ecosystem as identified by the Regional ecological RNA evaluation.	Yes, the area has native ponderosa pine forest (un-logged) and some small grasslands.	
Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species.	Yes, there is an Mexican Spotted Owl pack in the northern and southern portions of the area.	
Area serves as a baseline or reference area for the study of long-term ecological processes such as disturbance, hydrologic processes, climate change, or other processes.	There is a weir to study water flow so it is uniquely positioned to look at hydrological processes.	
Area serves as a control area for comparing results from manipulative research.	Yes, the area is a control for silvicultural/watershed research in the Upper Beaver Creek watershed.	
Area boundaries encompass an area large enough to provide essentially unmodified conditions within their interiors, which are necessary in accordance with the objectives stated in the establishment record (FSM 4063.02), and to protect the ecological processes, features, and/or qualities for which the RNA was established. Although not required, entire small drainages are ideal because they maintain interrelationships of terrestrial and aquatic systems.	It is all one vegetation type and provides an example of conditions unmodified by vegetation management activities.	Fire suppression has altered the ecological processes. There is a livestock tank in the RNA and road used to access it. There is also a water pipe that delivers water to a nearby private parcel.

<b>Table 2C: Review of Representative Ecological Conditions - Rocky Gulch Potential RNA</b>		
<b>Criteria</b>	<b>YES (state justification)</b>	<b>NO (state justification)</b>
Area shows little or no evidence of major disturbances by humans. Activities, such as livestock grazing and other uses have not had affected area beyond ability to recover. No evidence of timber cutting in past 50 years.	Yes, area has little human impacts. Grazing occurred but did not affect area.	
Area reflects its original, near-pristine condition <i>as closely as possible</i> .	Yes	Fires suppression has altered the ecological processes.
The best available, qualified area was chosen. In certain geographic regions and in certain community types, it may be impossible to find candidate areas that do not contain exotic plant or animal life.	Yes, this area was chosen in the last planning cycle as a good candidate for both the pine forests and hydrological function.	

#### ***Other considerations for RNA Establishment***

***Prior and Ongoing Research:*** Prior research includes numerous publications on bird community dynamics, dwarf mistletoe, numerous papers on hydrology, water yield, multiple use values.

*“best history of prior research of any proposed or designated RNAs in Region 3. This is due to its inclusion as one of the control areas in the Beaver Creek Experimental Watershed Project from 1959-1983. Data on precipitation, streamflow, sediment loads, range, and timber are available at <http://ag.arizona.edu/OALS/watershed/beaver/>.”* -Charles McDonald, Regional RNA Coordinator

There is current research taking place within the potential RNA. *“This watershed has been instrumented again to study the effects of fuels treatments. It is an un-treated control or reference watershed. Access is from the South outside the RNA.”* -Dan Neary, Rocky Mountain Research Station.

***Ongoing Uses:*** No known activities in the control portion of the watershed.

## **Conclusions**

All of the established RNAs continue to meet the criteria for their designations. The proposed Forest Plan addresses the management issues identified by the RNA evaluation, particularly those related to recreation impacts. These RNAs are part of all plan alternatives (See DESI Volume 2 for more details).

Recommendations for the establishment of the Rocky Gulch Proposed RNA and the eastern extension of the San Francisco Peak extension, as they were proposed in the 1986 Forest Plan is included in all plan alternatives because they were determined to meet the criteria for RNA.

West Clear Creek RNA as it was originally proposed in the 1986 Plan was determined to be too heavily impacted by recreation to be recommended in the revised plan. The area could not be managed to prevent recreation impacts to the resources of the RNA without diminishing the wilderness experience. The Forest, therefore, is recommended RNA with similar characteristics in a new location in Alternatives B, C and D, that mitigates the recreation impacts to the resources associated with the proposed RNA.

The western extension of the San Francisco Peaks RNA did not meet the criteria of a RNA in the evaluation because it does not have any regionally underrepresented vegetation or features. In addition, it is not recommended because its characteristics are not in keeping with the purpose of the established RNA.



## **Preparers/Contributors**

Sara Dechter	Forest Plan Revision Social and Economic Lead
Heather Green	Forest Plan Revision Ecological Lead
Chris Barrett	Database and GIS Specialist
Noah Bard	GIS and Data Services Specialist
Janie Agyagos	District Biologist (Red Rock Ranger District)
Debbie Crisp	Forest Botanist
Jen Kevil	Forest Plan Revision Social and Economic Lead (former)
Christine Paulu	Natural Resource Specialist (former)
Barb Phillips	Zone Botanist- Coconino, Kaibab, Prescott (former)

## **People contacted for on-the-ground information:**

### Rocky Mountain Research Station:

Dan Neary, Research Soil Scientist, Rocky Mountain Research Station

Carolyn Sieg: Former RNA Coordinator for RMRS

Rosemary Pendleton: RNA Coordinator for RMRS

### US Forest Service

Charlie McDonald: Regional RNA Coordinator

### Merriam-Powell Center for Environmental Research

Neil S. Cobb, Director

## References

United States Forest Service (USFS). 2009. 36 CFR Part 219.7 Developing, Amending, or Revising a Plan, U.S. Department of Agriculture. Federal Register.

United States Forest Service. 2007. Forest Service Manual. 1905 Definitions. Amendment No. 1900-2007-2. U.S. Department of Agriculture, Forest Service, Research, Washington, DC. pg.6-17.

United States Forest Service. 2005. Forest Service Manual 4063 Research Natural Areas, Amendment No. 4000-2005-3. U.S. Department of Agriculture, Forest Service, Research, Washington, DC. pg.12-29.

United States Forest Service Southwestern Region RNA Work Group. 2009. Research Natural Area Process for Forest Plan Revision under the 1982 Planning Rule Provisions. U.S. Department of Agriculture, Forest Service Region 3, Albuquerque, NM.

## Appendix A – West Clear Creek New and Original Proposed Boundary

