United States
Department of
Agriculture

Forest
Service

**Southwestern
Region**

# FINAL Research Natural Areas Specialist Report

## Forest Plan Revision Final Environmental Impact Statement

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# Specialist Report

## Introduction

Research Natural Areas (RNA) 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).

RNAs are considered a type of Special Area. Special Areas 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. Existing Forest Plans have administratively designated special areas, such as RNAs, botanic areas, or geologic areas.

Special Area recommendations are one of the Forest Plan components (FSM 1921.11 – Plan Requirements - based on 36 CFR 219.7(a)(2)). RNAs, as types of special areas must be supported by the desired conditions and other plan components developed in the revised forest plans. The Need for Change assessment, conducted during the Comprehensive Evaluation Reporting (CER Phase I) will also help identify any need for new RNAs, or for recommendation and establishment of previously proposed RNAs, or for 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)) as long as no site-specific project or activities are approved. Formal RNA establishment, projects, or activities would have to be handled in a subsequent site-specific NEPA process. Note: While Forests must consider or analyze the need for new RNAs during Plan Revision, they are not required to establish new RNAs if not found necessary or appropriate during the analysis.

This report evaluates and discloses the potential environmental consequences on the special area: RNAs that may result with the adoption of a revised land management plan. It examines, in detail, four different alternatives for revising the 1987 Apache-Sitgreaves NFs (A-SNFs) land management plan (1987 forest plan).

## Relevant Laws, Regulations, and Policy that Apply

**Organic Administration Act of 1897** (16 U.S.C. 551) - authorizes the Secretary of Agriculture to designate RNAs.

**7 CFR 2.60** – the Secretary has delegated this authority to the Chief who, pursuant to 36 CFR 251.23, selects and establishes RNAs as part of the continuing land and resource management planning process for NFS lands (**36 CFR 219.25**).

**FSM 4063** – Research Natural Areas – provides guidance on selection and management of RNAs.

## Methodology and Analysis Process

The A-SNFs followed the regional work group process *Research Natural Area Process for Forest Plan Revision under the 1982 Planning Rule Provisions* (Forest Service, 2010a). The paper described how to incorporate RNAs into the forest plan revision process. See the paper for the detailed methodology. The results of the evaluation were used to develop RNA recommendations for the revised plan.
Major components of the regional process:

**Regional RNA Inventory** - A regionwide (Arizona and New Mexico) inventory of existing and previously proposed RNAs, inside and outside of the agency, was completed. There are a total of 18 designated or formally established RNAs within the region. There are an additional 28 RNAs that were previously proposed (recommended), but never formally established.

**Ecological Representativeness of Established RNAs in the Region** - A regionwide coarse-filter assessment of RNA ecological representation was conducted to help identify ecosystems and vegetation types that are underrepresented among the Region's currently established RNAs. The existing RNAs and other protected lands, inside and outside the agency, were compared with the distribution of PNVT [1] (Potential Natural Vegetation Type) classes, ecological sections, and TEUI (Terrestrial Ecological Unit Inventory) climate gradients. RNA needs were ranked on a scale of 1 to 3; 1 reflecting the least degree of need according to those criteria of representativeness used for this assessment; rank of 3 reflects the greatest degree of need (meaning there is very little to no representation of a particular ecosystem type).

**Forest Plan Evaluation** - The process outlined the steps for evaluating established RNAs and consideration of existing or new proposals. These steps were used to evaluate existing and potential RNAs. Documentation can be found in *Forest Plan Revision Resource Evaluations Apache-Sitgreaves National Forests* (Forest Service, 2010b, 2012). The evaluation tables from the assessment are duplicated in appendix A of this document.

The plan will carry forward existing RNAs and recommend RNAs. Following approval of the plan, the forests will send the recommended RNA records (FSM 4063.41) and documents to the Regional RNA Committee. The Regional RNA Committee will then compile an establishment record, ecological evaluation, and NEPA environmental assessment (FSM 1950 and FSH 1909.15). After compiling the necessary documentation, the Committee may recommend the establishment of the RNA. If approved by the Regional Forester, with concurrence of the Station Director, the plan will then be amended to recognize these areas as designated RNAs.

## Assumptions

In the analysis for this resource, the following assumptions have been made:

- In all alternatives (because they must conform to FSM 4063 direction), both designated and recommended RNAs are protected and maintained in a natural condition for the purpose of conducting non-manipulative research and for fostering education. However, if necessary to further

[1] The Apache-Sitgreaves NFs can be divided into 14 PNVTs. PNVTs represent the vegetation type and characteristics that would occur when natural disturbance regimes and biological processes prevail.

research, RNAs can be used for manipulative research purposes to help quantify and understand ecosystem processes and to improve forest management practices (Forest Service, 2010a).
- They are managed for non-motorized access. Recreational use may be restricted or prohibited if use threatens or interferes with the objectives of the RNA. Logging and wood gathering activities are not permitted. Livestock grazing may occur where needed to establish or maintain vegetative communities (Forest Service, 2010a).
- Recommended RNAs will be designated within 5 years of the plan's record of decision or a plan amendment will be completed to return the land area to other management.
- There is no conflict from motorized use, logging, wood gathering, or other manipulative uses because these uses are not permitted in RNAs.
- In all alternatives, completion of RNA designations and establishment reports would depend on agency capacity (staffing, budget). Implementation of establishment reports and management plans should provide additional emphasis toward meeting the desired conditions of the RNAs. Until designation, recommended RNAs will be managed to protect and maintain a natural condition for the purpose of conducting non-manipulative research and for fostering education. Revision Topics Addressed in this Analysis

Recommended Research Natural Areas:

- Number of designated/recommended RNAs
- Acres of designated/recommended RNAs
- Percent of forest in designated/recommended RNA classification.

## Summary of Alternatives

A summary of alternatives, including the key differences among alternatives, is outlined in the Draft Environmental Impact Statement.

## Description of Affected Environment (Existing Condition)

Research Natural Areas (RNAs) are considered special areas by the Forest Service. RNAs are part of a national network of natural areas designated in perpetuity for research and education and/or to maintain biological diversity on NFS lands. RNAs are principally for non-manipulative research, observation, and study. They also may assist in implementing provisions of special acts, such as the Endangered Species Act of 1973 and the monitoring provisions of the National Forest Management Act of 1976 (FSM 4063).

RNAs are defined (FSM 4063.05) 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. However, under unusual circumstances, deliberate manipulation may be utilized to maintain the unique feature that the RNA was established to protect.

The objectives (FSM 4063.02) of establishing RNAs are to:

1. Maintain a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and other vegetation types, and natural

landscapes that have scientific interest and importance that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity.
2. Preserve and maintain genetic diversity, including threatened, endangered, and sensitive species.
3. Protect against human-caused environmental disruptions.
4. Serve as reference areas for the study of natural ecological processes including disturbance.
5. Provide onsite and extension educational activities.
6. Serve as baseline areas for measuring long-term ecological changes.
7. Serve as control areas for comparing results from manipulative research.
8. Monitor effects of resource management techniques and practices.

During the forest plan revision process, an evaluation (Forest Service, 2010b, 2012) was conducted to determine the need for existing or additional RNAs. The primary criterion for determining need was the lack of ecological representation in the RNA system regionwide. The following table (table 1) displays the ecological types that were ranked as either a moderate or high need and are appropriate for RNA recommendation (Forest Service, 2008a, 2008b).

**Table 1. List of ecological types (potential natural vegetation types) that are lacking representation in the regionwide Research Natural Area system.**

| Ecological Types (Potential Natural Vegetation Types)[1] | | | |
|---|---|---|---|
| alpine and tundra | cottonwood-willow riparian forest (CWRF) | gallery coniferous riparian forest | Gambel oak shrubland |
| juniper grassland | Madrean encinal woodland | montane willow riparian forest (MWRF) | mountain mahogany shrubland |
| piñon-juniper evergreen shrub | piñon-juniper woodland (PJW) | ponderosa pine forest (PPF) | sagebrush shrubland |
| sandsage | semi-desert grassland (SDG) | shortgrass prairie | wetland/cienega riparian areas (WCRA) |

[1] Shaded cells indicate those ecological types (Potential Natural Vegetation Types) that occur on the Apache-Sitgreaves NFs

Past actions have influenced the identification of the current pool of RNAs. For example, a wide variety of land uses have occurred on the A-SNFs that have resulted in changes to vegetation structure, composition, and function (Forest Service, 2008c). These actions have narrowed the pool of potential RNA candidates (those areas that are least disturbed).

Currently, the A-SNFs have one designated RNA, Phelps Cabin, and one designated botanical area, Phelps Cabin Botanical Area (appendix A map 1). The 1987 forest plan recommends four RNAs: Thomas Creek, Escudilla Mountain, Wildcat, and Hayground (table 2).

The existing Phelps Cabin RNA is approximately 290 acres and is located on the Springerville Ranger District. It was established in 1970 to protect its natural condition and provide scientific study and education, and for the maintenance of biological diversity. Located at approximately 9,400 feet in elevation, a portion of the RNA lies within the Mount Baldy Wilderness. The overall terrain is gently rolling. Wetland/cienega communities contain several plant species of special interest including the Arizona willow (*Salix arizonica* Dorn.) and sulphur Indian paintbrush (*Castilleja sulphurea* Rydb.). Mixed conifer forest with spruce, fir, and aspen are present on uplands adjacent to the wet meadows (appendix A table 1 and appendix A map 1).

The forest has one botanical area (appendix A map 1); the Phelps Botanical Area is approximately 100 acres and is located along the East Fork of the Little Colorado River, partly within the Phelps Cabin RNA, but outside the nearby Mount Baldy Wilderness. It is the only botanical area on the A-SNFs. It has been under special management for botanical and research values since 1910. Botanical areas are units of land,

designated by the Secretary of Agriculture or the Regional Forester, that contain unique plant specimens, communities, habitat, or ecology deemed worthy of special protection.

The recommended Hayground RNA (appendix A map 2) is approximately 400 acres and is located on the Alpine Ranger District. It provides an example of undisturbed blue spruce streamside forest and may provide opportunities for research related to silvicultural practices in this vegetation type. Hayground Creek, which runs through this RNA and provides habitat to the Apache trout, has been designated a water of exceptional quality by the State of Arizona. This proposed RNA has not been acted upon since recommended in 1987 (appendix A table 2).

The recommended Escudilla Mountain RNA (appendix A map 3) is approximately 960 acres and is located on the Alpine Ranger District and within the Escudilla Wilderness. It represents a subalpine grassland, and ponderosa pine, dry mixed conifer, wet mixed conifer, and spruce-fir forest vegetation types where natural processes dominate. Herbaceous plant species include tufted hairgrass, Arizona fescue, and mountain muhly. The area was intended to serve as a natural ecosystem for research purposes because the condition of the herbaceous vegetation is healthy and the area is not allocated for livestock grazing. This proposed RNA has not been acted upon since recommended in 1987 (appendix A table 3).

The recommended Thomas Creek RNA (appendix A map 4) is approximately 550 acres and is located on the Alpine Ranger District within a Mexican spotted owl protected activity area. It provides a representation of the wet mixed conifer forest vegetation type and can serve as a reference for the study of succession and as a baseline for measuring long-term change. The area may also serve as a control for evaluating the effects of fire and silvicultural prescriptions for timber and water production. It can also serve as an area to study the effects of climate change because the spruce-fir vegetation type is sensitive to changes in temperature and moisture (appendix A table 4).

The recommended Wildcat RNA (appendix A map 5) is approximately 530 acres and is located on the Black Mesa Ranger District. It was intended to represent a functioning piñon-juniper woodland vegetation type where natural processes dominate. This area contributes to the protection of genetic diversity of the piñon-juniper woodland type and can serve as a reference for studying grazing impacts and fire recovery in piñon-juniper. This RNA also includes a portion of Wildcat Creek which supports a cottonwood-willow riparian vegetation community. This proposed RNA has not been acted upon since recommended in 1987 (appendix A table 5).

In addition to the designated RNAs and the RNAs recommended in the 1987 forest plan, four potential areas were evaluated: Three Forks, Lower Campbell Blue, Corduroy, and Sandrock.

The recommended Three Forks RNA (appendix A map 6) is approximately 2,900 acres and is located on the Alpine Ranger District. This area provides a representation of montane willow riparian forests, fens, and wetlands/cienegas unique to the A-SNFs and habitat for several rare aquatic species: California floater, Three Forks springsnail, loach minnow, and Chiricahua leopard frog. This area provides research opportunities and serves as a reference for studying effects of fire, climate change, and other management activities. It may also serve as a research area for control of invasive species, such as crayfish and bullfrogs, while maintaining native species (appendix A table 6).

The recommended Lower Campbell Blue RNA (appendix A map 7) is approximately 580 acres and is located on the Alpine Ranger District. This area is a prime example of high quality riparian vegetation and old growth forests. It provides habitat for Chiricahua leopard frog, New Mexico meadow jumping mouse, and Mexican spotted owl, and critical habitat for loach minnow. This area may serve as a reference for studying grazing impacts in riparian areas and climate change (appendix A table 7).

The recommended Sandrock RNA (appendix A map 8) is approximately 530 acres and is located on the Clifton Ranger District. It represents semi-desert grassland vegetation type containing a variety of native grasses and forbs. This area has been excluded from domestic grazing for 25 years and provides a reference for studying past and future grazing effects (appendix A table 8).

The recommended Corduroy RNA (appendix A map 9) is approximately 3,350 acres and is located on the Alpine Ranger District. It contains a portion of Fish Creek which is a designated Apache trout recovery stream. It provides a representation of high-elevation vegetation types including aspen. This area may help researchers and foresters learn more about the multiple causes of sudden aspen decline (SAD) which is widespread across the A-SNFs and other Arizona forests. SAD results in the death of aspen root systems, thus causing total loss of aspen clones from affected sites (appendix A table 9).

Table 2 above displays the results of the evaluation. In order to better contribute to the regionwide need for RNAs, it is recommended that the A-SNFs:

1. Retain the designated Phelps Cabin RNA and add the Phelps Botanical Area to the RNA;
2. Withdraw three currently recommended RNAs (Escudilla Mountain, Hayground, and Wildcat);
3. Continue to recommend the Thomas Creek RNA; and
4. Recommend four new RNAs (Three Forks, Lower Campbell Blue, Sandrock, and Corduroy).

**Table 2. Results of the Apache-Sitgreaves NFs Research Natural Area Evaluation**

| RNA Name | Status | Size (acres) | Ecological Types (Potential Natural Vegetation Types) that are Non- or Under-Represented in the Southwestern Regionwide RNA System | | | | | | Recommend or Withdraw |
|---|---|---|---|---|---|---|---|---|---|
| | | | cottonwood-willow riparian forest (CWRF) | montane willow riparian forest (MWRF) | piñon-juniper woodland (PJW) | ponderosa pine forest (PPF) | semi-desert grassland (SDG) | wetland/ cienega riparian areas (WCRA) | |
| Corduroy | Evaluated during plan revision | 3,350 | | X | | X | | | **Recommend**, this area also contains quaking aspen and riparian vegetation communities. |
| Escudilla Mountain | Recommended in the 1987 forest plan | 960 | | | | | | X | **Withdraw** recommendation, spruce-fir and montane/subalpine grassland are already well-represented in the region. The area is within the Escudilla Wilderness. |
| Hayground | Recommended in the 1987 forest plan | 400 | | X | | | | X | **Withdraw** recommendation, ecological representation found in other designated and recommended RNAs. |
| Lower Campbell Blue | Evaluated during plan revision | 580 | X | | | X | | | **Recommend**, this area also contains springs and perennial creeks. |
| Phelps Cabin | Existing designated RNA | 290 | | X | | | | X | **Recommend** with addition of the Phelps Botanical Area |
| Sandrock | Evaluated during plan revision | 530 | | | | | X | | **Recommend,** good representation of semi-desert grassland vegetation containing a variety of native grasses and forbs |
| Thomas Creek | Recommended in the 1987 forest plan | 550 | | | | | | | **Recommend**, although this area does not contribute to the regional need, it is a control area for watershed research. |
| Three Forks | Evaluated during plan revision | 2,900 | | X | | X | | X | **Recommend**, this area also contains unique aquatic habitat (fens) and wildlife species. |
| Wildcat | Recommended in the 1987 forest plan | 530 | X | | X | X | | | **Withdraw** recommendation, this area was burned in wildfires and no longer provides undisturbed old growth piñon-juniper woodland. |
| **Total Recommended RNA Acres** | | **8,200** | **Corduroy, Lower Campbell Blue, Phelps Cabin, Sandrock, Thomas Creek, Three Forks** | | | | | | |
| **Total Recommended Withdrawl RNA Acres** | | **1,890** | **Escudilla Mountain, Hayground, Wildcat** | | | | | | |

## Environmental Consequences

The prime consideration in managing RNAs is maintenance of natural conditions and processes. To the extent practicable, protect RNAs against human activities that directly or indirectly modify the integrity of the ecological processes (USFS, 2010a).

Alternative A would continue current management with one designated RNA (Phelps Cabin) and four recommended RNAs (Thomas Creek, Escudilla Mountain, Wildcat, and Hayground). The Phelps Botanical Area would continue to be managed as a separate special area. Alternative A does not contribute to the regional need for additional RNAs.

Alternatives B and C would combine the Phelps Cabin RNA and the Phelps Botanical Area into one special area, the Phelps Cabin RNA (table 3). This would increase the existing designated RNA by approximately 100 acres. These alternatives also recommend five RNAs (Thomas Creek, Three Forks, Lower Campbell Blue, Sandrock, and Corduroy). These alternatives contribute to regional need for additional RNAs by providing representation in four ecological types.

Alternative D would combine the Phelps Cabin RNA and the Phelps Botanical Area into one special area, the Phelps Cabin RNA (table 3). This would increase the existing designated RNA by approximately 100 acres. This alternative also recommends two RNAs (Corduroy and Three Forks). The other areas (Thomas Creek, Lower Campbell Blue, and Sandrock) are located in recommended wilderness management areas under this alternative where there is no need for RNA designation. This alternative contributes to regional need for additional RNAs by providing representation in four ecological types.

Alternatives B and C, because they have the greatest number and acreage of RNAs, would have the most beneficial cumulative consequences to other resources such as water, riparian areas, and species habitat because of the non-manipulative management emphasis in these areas.

All of the alternatives would contribute areas to the regional network of RNAs if the recommended RNAs are selected and designated. The action alternatives add ecological representation to the system, with B and C providing the greatest contribution. While Alternative A has the fewest acres managed in RNAs, all alternatives allocate less than one percent of the forests' total acreage as RNAs (table 3).

RNAs, because of their non-manipulative management emphasis, contribute to achieving many of the plans' desired conditions, in particular those that call for restoration of natural ecological processes and opportunities for research and study.

**Table 3. Number and amount of designated and recommended Research Natural Areas by alternative**

| RNA Variable | Alternatives | | | |
|---|---|---|---|---|
| | alternative A | alternative B | alternative C | alternative D |
| Number of Designated RNAs | 1 | 1 | 1 | 1 |
| Number of Recommended RNAs | 4 | 5 | 5 | 2 |
| Acres in Designated and Recommended RNAs | 2,549 | 8,119 | 8,119 | 6,231 |
| Percent of Forests in Designated and Recommended RNAs | 0.13%[2] | 0.40% | 0.40% | 0.31% |

[2] Total forest acreage is 2,015,352 acres

Extractive or ground-disturbing activities could occur in the vicinity of RNAs. Such activities could lead to environmental consequences such as riparian impacts from upstream activity; however, the consequences would be minor because Forest Service actions would be influenced by plan standards and guidelines for protecting water resources and riparian areas.

Because non-motorized recreational use is generally allowed, there may be environmental consequences caused by recreationists; however they should be limited since Forest Service policy states, "recreational use may be restricted or prohibited if use threatens or interferes with the objectives of the RNA."

Although grazing is allowed in RNAs (USFS, 2010a), there should be limited consequences from livestock grazing because only one of the RNAs is permitted for livestock grazing (Thomas Creek RNA). See the table 4 below.

**Table 4. Status of grazing allotments containing recommended Research Natural Areas**

| Recommended RNA | Livestock Grazing Status |
|---|---|
| Sandrock | Located within the Sandrock Allotment which was closed to grazing in 1987, and is not allocated under a grazing permit |
| Lower Campbell Blue | Located within the Lower Campbell Blue Allotment which was waived back to the Forest Service in 2001, and is under non-use and is not allocated under a grazing permit |
| Corduroy | Located within the Hannagan Allotment which was waived back to the Forest Service in 2001, and is under non-use and is not allocated under a grazing permit |
| Three Forks | Located within the Black River Allotment which was waived back to the Forest Service in 2002, and is under non-use and is not allocated under a grazing permit |
| Thomas Creek | Located within the West Thomas pasture of the Foote Creek Allotment, where livestock grazing only occurs after August 31, for Mexican spotted owl habitat recover and to protect RNA values |

Grazing by wildlife, especially elk, could impact the Phelps Cabin, Wildcat, Hayground, Three Forks, Lower Campbell Blue, and Corduroy RNAs by altering the amount and composition of key vegetative components, such as willow and aspen. However, implementation of plan guideline 'management measures should be used (e.g., fencing) to protect unique features' should minimize the impact.

Non-native invasive plants may threaten to infest the RNAs in the future. It is reasonable to assume these areas may be priorities for control of infestations so that the impact on RNA values will be limited.

There should be no environmental consequences from the extraction of minerals, since there are no known mineral activities in the RNAs and designated RNAs are withdrawn from mineral entry.

None of the alternatives are expected to have measurable environmental consequences on the overall natural condition of these areas. Both the current plan and the proposed plan emphasize limited human intervention and non-consumptive/non-manipulative uses.

Relationship of Short-Term Uses and Long-Term Productivity

Since few management activities are allowed in RNAs (no logging, no road building) there would be no commodity-related productivity (timber, firewood) (USFS, 2010a). However, because the areas are managed to emphasize limited human intervention and non-consumptive/non-manipulative uses, the basic ecological productivity (vegetation structure, composition, function and wildlife needs) is expected to benefit.

## Cumulative Environmental Consequences

The cumulative environmental consequences analysis area is both the A-SNFs and the regional (Arizona and New Mexico) network of RNAs. It is reasonably foreseeable that the other Arizona and New Mexico national forests will recommend new RNAs during their forest plan revision efforts. This may result in more areas recommended than are actually needed in the regional RNA system and may trigger a need to withdraw areas recommended in the A-SNFs plan.

## Adaptive Management

Per FSM 4060, the establishment records must include information on management prescriptions, use or control of fire and grazing, and any specific management recommendations. This provides an opportunity to include new information and adapt to changed conditions when the recommended RNAs become designated.

## Other Planning Efforts

The Bureau of Land Management manages the 120 acre Coronado Mountain RNA which is located directly adjacent to the forest boundary on the southern end of the Clifton Ranger District. This area is managed to preserve the scenic quality, allowing the use of prescribed fire. Rights-of-way, mineral entry, and woodcutting are not allowed. There are no known conflicts with this or other planning efforts.

## References


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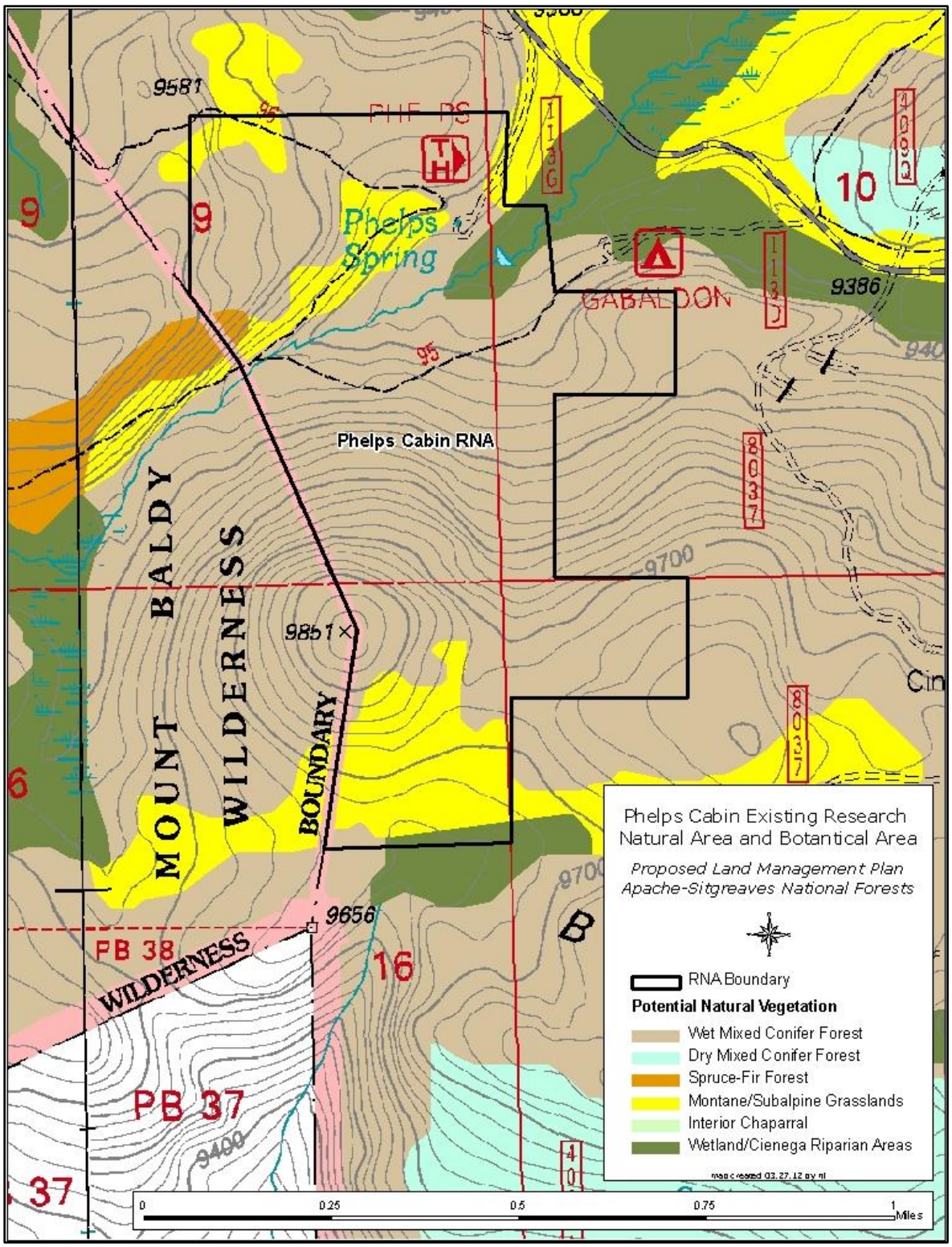
# Appendix A - Apache-Sitgreaves NFs' Research Natural Area Evaluations[3] and Research Natural Area Maps

[3] The full RNA evaluation can be found in *Forest Plan Revision Resource Evaluations Apache-Sitgreaves National Forests* (Forest Service, 2010a). Background on the process can be found in *Research Natural Area Process for Forest Plan Revision under the 1982 Planning Rule Provisions* (Forest Service, 2010b)

**Appendix A table 1. Evaluation of the existing Phelps Cabin Research Natural Area and Phelps Cabin Botanical Area (see appendix A map 1)**

| Step | Review of Research Natural Area Management Direction | Phelps Cabin Research Natural Area and Phelps Cabin BA | Size (300 Acre Research Natural Area + 100 Acre Botanical Area) = 400 Acres |
|---|---|---|---|
| | criteria | YES (state justification if necessary due to circumstances) | NO (state justification) |
| 1 | Does current Forest Plan management direction protect this RNA against human-caused environmental disruptions in this RNA?<br>a. What are some of the threats that may affect this RNA? Motorized use? Trespass? Mineral exploration or development?<br>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). | Grazing - currently not allowed. Eliminated in 2006. ("RNAs are assigned no grazing capacity") Excerpts from 1987 forest plan:<br>• Recreation: "manage current dispersed recreation at standard service level"<br>• "Prepare a dispersed use implementation plan with the objective of identifying the recreation attractions and means to discourage use."<br>• "Implement the [above] plan. Do not encourage recreation use in these areas."<br>• "RNAs are fenced to protect them as necessary [from livestock]." | Current threats: Increasing recreation (campground next to area, trailhead, and two trails going through the area). Campground is a horse campground that may encourage use of meadows for stock feeding and watering. The trails receive very high use. High use on the trails may threaten the unique botanicals by allowing access for potential collection of rare plants such as: calypso. Fishing is heavy along the East Fork Little Colorado River. Increased ungulate (elk) herbivory threatens Arizona willow. May have livestock trespass (horses and cattle) from adjacent non-forest lands. |
| 2 | Does the RNA continue to be managed as a physical or biological unit 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. However, under unusual circumstances, deliberate manipulation may be utilized to maintain the unique feature that the RNA was established to protect. | YES - If recreation use continues to increase, it may represent a future threat to the natural conditions. | Although the RNA has still not been fenced, it no longer has any authorized grazing within or adjacent to it. |
| 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 RNA was established to protect. | YES | Livestock grazing (herbivory) has been halted. Beaver are no longer occupying area. |
| 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 RNA (FSM 4063.35). | YES - Only the wilderness portion of the RNA has been withdrawn from mineral entry. | |
| **Summary and Need for Change – YES - Recommend retaining Phelps Cabin Research Natural Area. Change Phelps Cabin Research Natural Area boundary to include Phelps Botanical Area - carry over all existing Land Management Plan direction and implement it** | | | |



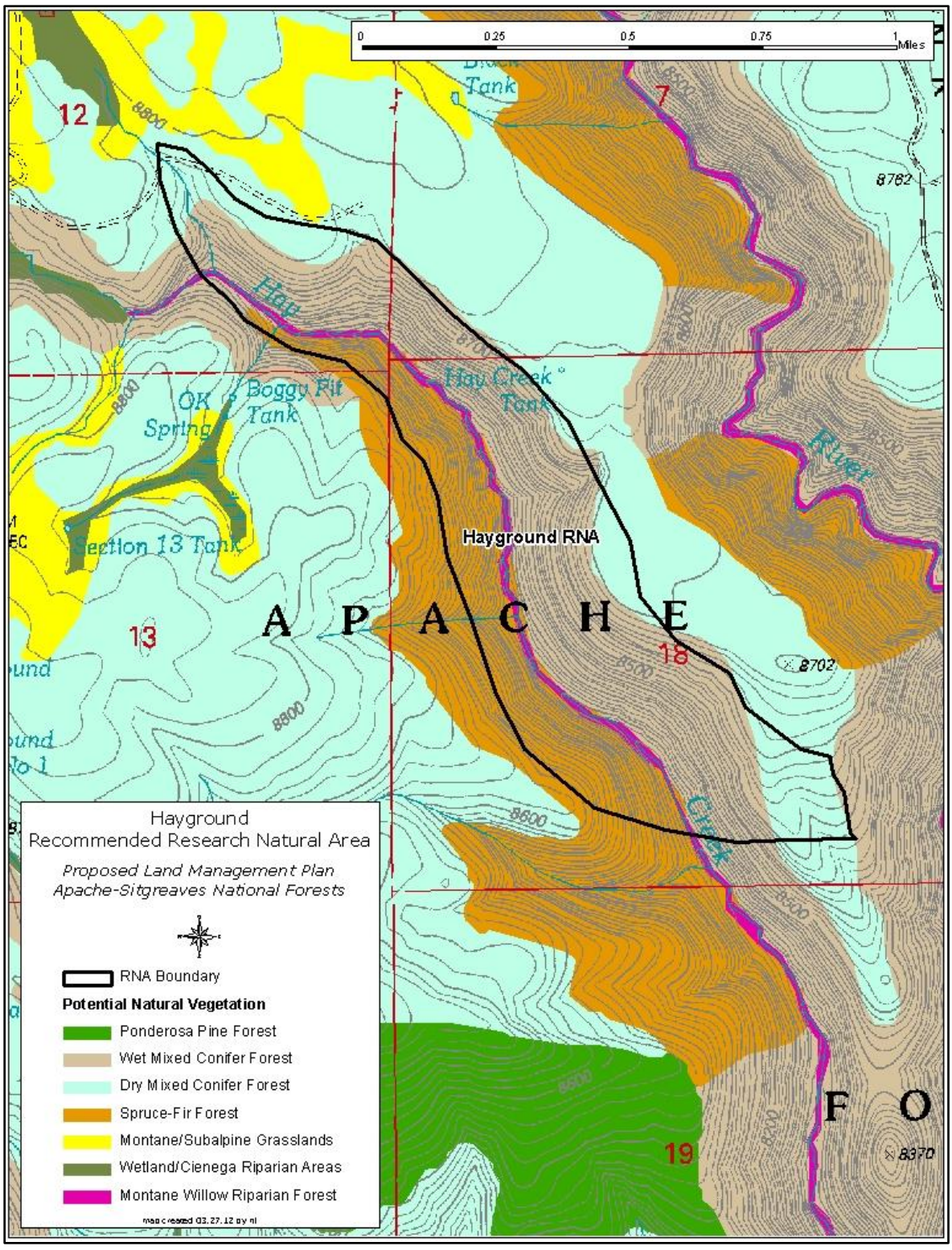

**Appendix A map 1. Phelps Cabin Research Natural Area, Phelps Cabin Botanical Area, and potential natural vegetation types (PNVT). It is recommended to add the botanical area to the Phelps Cabin Research Natural Area. The montane willow riparian forest PNVT parallel to East Fork Little Colorado River does not appear at the map scale presented**

**Appendix A table 2. Evaluation of the currently recommended Hayground Research Natural Area (see appendix A map 2)**

| Step | Review of Representative Ecological Conditions | Proposed Hayground Research Natural Area | Proposed Size (530 Acres) |
|---|---|---|---|
| | criteria | YES (state justification if necessary due to circumstances) | NO (state justification) |
| 1 | Review RNA Representative Assessment Spreadsheet<br>a. 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?<br>b. Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br>c. If you have previously proposed RNAs in your current Forest Plan, do they fall within PNVT classes with rankings of 2 or 3? | YES - Wetland/cienega riparian areas (WCRA) (14 ac.) = 2, Montane/subalpine grasslands (MSG) (5 ac) = 2. Apache trout stream that is a 2nd order perennial stream with many springs and seeps. Hay Creek is a Unique Water in the state of Arizona. Creek is inaccessible but is rated as functioning at risk. The far northwestern wetlands are in non-functioning. | No - Most of the following vegetation types were burned during the 2011 Wallow fire. Spruce-fir forest (SFF) (blue spruce) (143 ac.) = 1, Wet mixed conifer forest (WMCF) (20 ac.) = 1, and Dry mixed conifer forest (DMCF) (218 ac.) = 1 |
| 2 | Use the Conditions listed below to determine if these low-representative PNVT class areas or aquatic habitats are appropriate for RNA establishment | State reason why the area meets the criterion | State reason why the area does not meet the criterion |
| 2a | 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 - Represents WCRA type. | NO - Most of the SFF was burned during the 2011 Wallow fire |
| 2b | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species. | YES - Represents MWRF type with montane willows present, Goodding's onion, Apache trout, American dipper | |
| 2c | 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 - 98 percent of this area was burned during the 2011 Wallow fire. As much as 51% in the moderate and high severity categories. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | NO - 98 percent of this area was burned during the 2011 Wallow fire. As much as 51 percent in the moderate and high severity categories. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. This area is within the Black River Conservation Area - which provides resource protection. |
| 2d | Area serves as a control area for comparing results from manipulative research. | YES | |

**Appendix A table 2. Continued**

| Step | Review of Representative Ecological Conditions | Proposed Hayground Research Natural Area | Proposed Size (530 Acres) |
|---|---|---|---|
| | criteria | YES (state justification if necessary due to circumstances) | NO (state justification) |
| 2e | 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.<br>Although not required, entire small drainages are ideal because they maintain interrelationships of terrestrial and aquatic systems. | YES - Other than the Wallow fire, the drainage itself is relatively undisturbed and naturally inaccessible due to steep canyons side slopes. | |
| 2f | Area shows little or no evidence of major disturbances by humans, such as livestock grazing or timber cutting, for the past 50 years. | YES - Drainage canyon reach is naturally undisturbed due to inaccessibility. | NO - Upper end shows disturbance from livestock/ungulate grazing, but has been fenced from domestic grazing since the mid-1980s. |
| 2g | Area reflects its original, pristine condition as closely as possible. | YES - Drainage only | NO - WCRA is disturbed within last 25 years, but is now fenced. 98 percent of this area was burned during the 2011 Wallow fire. |
| 2h | 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. | | NO - Due to the severity of the Wallow fire this area contains non-native noxious and invasive weed species. It is likely that this area contains crayfish. |
| **Summary and Need for Change – YES - Withdraw Hayground Research Natural Area Recommendation - the regional-need ecological types (wetland/cienega riparian areas and montane-willow riparian forest potential natural vegetation) are covered in other A-SNFs' recommended Research Natural Areas. Also this area is within the Black River Conservation Area, which provides protections. In addition, this proposed Research Natural Area has not been acted upon since recommended in 1987.** | | | |



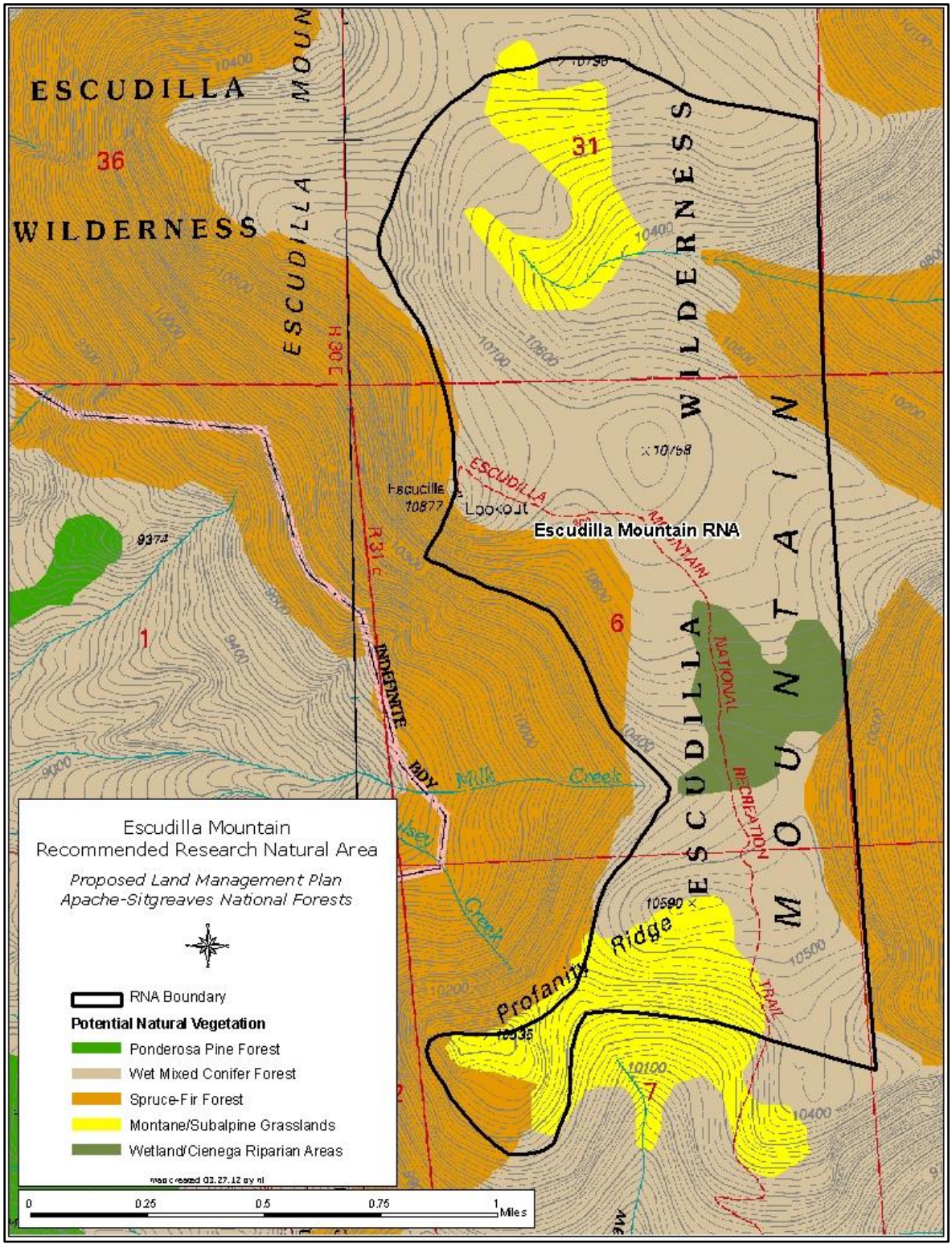

**Appendix A map 2. Currently recommended Hayground Research Natural Area and potential natural vegetation types. It is now recommended to withdraw this area**

**Appendix A table 3. Evaluation of the currently recommended Escudilla Mountain Research Natural Area (see appendix A map 3)**

| Step | Review of Representative Ecological Conditions | Proposed Escudilla Mountain Research Natural Area | Proposed Size (960 Acres) |
|---|---|---|---|
| | criteria | YES (state justification if necessary due to circumstances) | NO (state justification) |
| 1 | Review RNA Representative Assessment Spreadsheet<br>a. 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?<br>b. Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br>c. If you have previously proposed RNAs in your current Forest Plan, do they fall within PNVT classes with rankings of 2 or 3? | YES - WCRA based on soils as defined by TES (59 ac.) = 2 | NO - DMCF (25 ac.) = 1, WMCF (601 ac.) = 1, SFF (137 ac.) = 1, and MSG (140 ac.) = 1. No examples of outstanding riparian habitats. Because WCRA (59 ac.) = 1 has dried out and no longer has the characteristics of a WCRA |
| 2 | Use the Conditions listed below to determine if these low-representative PNVT class areas or aquatic habitats are appropriate for RNA establishment | State reason why the area meets the criterion | State reason why the area does not meet the criterion |
| 2a | 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. | | NO - PNVTs within this area are well represented across the Region - plus, the area is already receiving protection as a Wilderness Area. Therefore, it would rank as low priority for proposing as RNA. |
| 2b | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species. | YES - Area contains *Allium gooddingii*. | |
| 2c | 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 - 94 percent of this area was burned during the 2011 Wallow fire. As much as 89 percent in the moderate and high severity categories. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |
| 2d | Area serves as a control area for comparing results from manipulative research. | YES - 94 percent of this area was burned during the 2011 Wallow fire. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |

**Appendix A table 3. Continued**

| Step | Review of Representative Ecological Conditions | Proposed Escudilla Mountain Research Natural Area | Proposed Size (960 Acres) |
|---|---|---|---|
| | criteria | YES (state justification if necessary due to circumstances) | NO (state justification) |
| 2e | 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: | |
| 2f | Area shows little or no evidence of major disturbances by humans, such as livestock grazing or timber cutting, for the past 50 years. | YES: | |
| 2g | Area reflects its original, pristine condition as closely as possible. | YES: | NO - 94 percent of this area was burned during the 2011 Wallow fire. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. This area is already within the Escudilla Wilderness area. |
| 2h | 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: | |
| **Summary and Need for Change – YES - Withdraw Escudilla Mountain Research Natural Area Recommendation - potential natural vegetation types within this area are well represented across the Region - plus, the area is already receiving protection as a Wilderness Area. In addition, this proposed Research Natural Area has not been acted upon since its recommendation in 1987.** | | | |



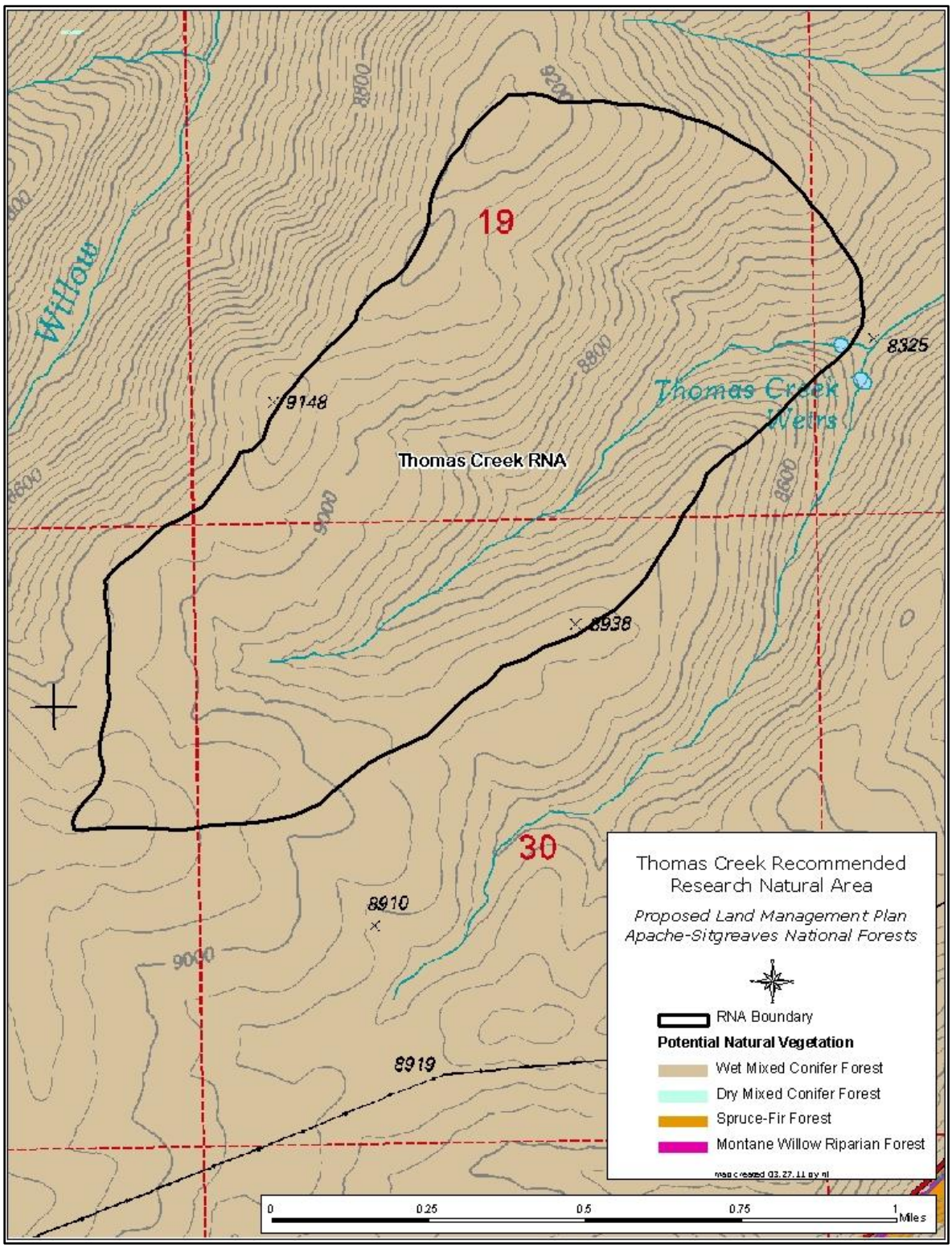

**Appendix A map 3. Currently recommended Escudilla Mountain Research Natural Area and potential natural vegetation types. It is now recommended to withdraw this proposed Research Natural Area**

**Appendix A table 4. Evaluation of the Currently Recommended Thomas Creek Research Natural Area (see appendix A map 4)**

| Step | Review of Representative Ecological Conditions<br>criteria | Proposed Thomas Creek Research Natural Area<br>YES<br>(state justification if necessary due to circumstances) | Proposed Size (550 Acres)<br>NO<br>(state justification) |
|---|---|---|---|
| 1 | Review RNA Representative Assessment Spreadsheet<br>a. 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?<br>b. Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br>c. If you have previously proposed RNAs in your current Forest Plan, do they fall within PNVT classes with rankings of 2 or 3? | YES - This is a Research Watershed – this is the Control area – research completed in the 1990s. | NO - All areas are WMCF |
| 2 | Use the Conditions listed below to determine if these low-representative PNVT class areas or aquatic habitats are appropriate for RNA establishment | State reason why the area meets the criterion | State reason why the area does not meet the criterion |
| 2a | 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 - This area was formerly of scientific interest for watershed management purposes – it is in relatively undisturbed condition, with no former logging. This area is a prime example of wet mixed conifer forest with virgin stands of timber and very light grazing pressure. | |
| 2b | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species. | YES - Is within a MSO Protected Activity Center, northern goshawk PFA, dusky grouse, gray collared chipmunk, Mexican wolves, and mountain tree frogs. | |
| 2c | 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 - 97 percent of this area was burned during the 2011 Wallow fire. As much as 41 percent in the moderate and high severity categories. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |
| 2d | Area serves as a control area for comparing results from manipulative research. | YES - Served as a control area during several decades of research. 97 percent of this area was burned during the 2011 Wallow fire. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |

**Appendix A table 4. Continued**

| Step | Review of Representative Ecological Conditions<br>criteria | Proposed Thomas Creek Research Natural Area<br>YES<br>(state justification if necessary due to circumstances) | Proposed Size (550 Acres)<br>NO<br>(state justification) |
|---|---|---|---|
| 2e | 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.<br><br>Although not required, entire small drainages are ideal because they maintain interrelationships of terrestrial and aquatic systems. | YES - 550 acres, includes the entire small upper watershed (headwater) drainage of Thomas Creek | |
| 2f | Area shows little or no evidence of major disturbances by humans, such as livestock grazing or timber cutting, for the past 50 years. | YES - it is in relatively undisturbed condition, with no former logging. This area is a prime example of the dry mixed conifer forest with virgin stands of timber and very light grazing pressure. | |
| 2g | Area reflects its original, pristine condition as closely as possible. | YES - This area is a prime example of the wet mixed conifer forest with virgin stands of timber and very light grazing pressure. | NO - 97 percent of this area was burned during the 2011 Wallow fire. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. |
| 2h | 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 - Probably contains a few, but no known invasive plant populations exist. Under 1987 Forest Plan, the area was not given any capacity for livestock grazing and was to be fenced from livestock if necessary. To be carried forward with recommendation for a RNA. | |
| **Summary and Need For Change – YES - Proposed Thomas Creek Research Natural Area Recommended** | | | |



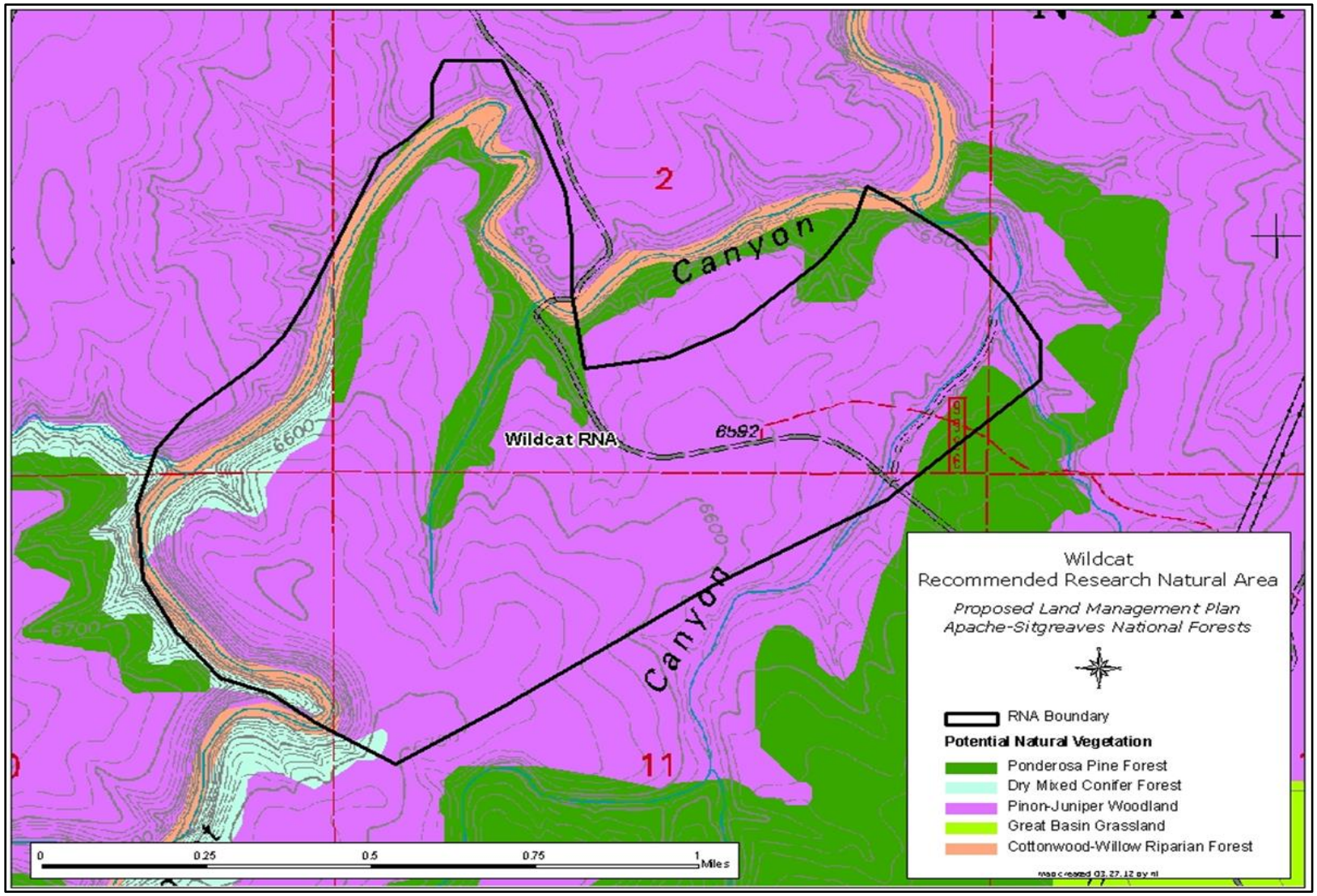

**Appendix A map 4. Currently recommended Thomas Creek Research Natural Area and potential natural vegetation types. It is proposed to retain the recommendation for inclusion within the Research Natural Area system. The montane willow riparian forest potential natural vegetation type parallel to Thomas Creek does not appear at the map scale presented**

**Appendix A table 5. Evaluation of the currently recommended Wildcat Research Natural Area (see appendix A map 5)**

| Step | Review of Representative Ecological Conditions | Proposed Wildcat Research Natural Area | Proposed Size (530 acres) |
|---|---|---|---|
| | criteria | YES (state justification if necessary due to circumstances) | NO (state justification) |
| 1 | Review RNA Representative Assessment Spreadsheet<br>a. 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?<br>b. Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br>c. If you have previously proposed RNAs in your current Forest Plan, do they fall within PNVT classes with rankings of 2 or 3? | YES - Piñon-juniper woodland (PJW) (2) and Ponderosa pine forest (PPF) (2) | Dry mixed conifer forest (DMCF) (1) - minor component |
| 2 | Use the Conditions listed below to determine if these low-representative PNVT class areas or aquatic habitats are appropriate for RNA establishment | State reason why the area meets the criterion | State reason why the area does not meet the criterion |
| 2a | 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 - Initially identified as an outstanding example of undisturbed old growth Colorado piñon-Utah juniper woodland. Few opportunities exist to represent this woodland in the RNA system in the Southwest due to the long history of human use (grazing). | NO – This recommended RNA no longer meets original intent of providing undisturbed PJW - because of wildfires. |
| 2b | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species. | YES - Ferruginous hawk, Gunnison's prairie dog, MSO – flora has not been thoroughly described, collected or studied. | |
| 2c | 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 - Reference area for comparison of fire disturbance regimes and effects of global climate change. Could be a reference (control) area for grazing impacts | |
| 2d | Area serves as a control area for comparing results from manipulative research. | YES - No current studies – potential as a piñon-juniper control for treatments | NO - No current studies |
| 2e | 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 - Area large enough | |

**Appendix A table 5. Continued**

| Step | Review of Representative Ecological Conditions<br>criteria | Proposed Wildcat Research Natural Area<br>YES<br>(state justification if necessary due to circumstances) | Proposed Size (530 acres)<br>NO<br>(state justification) |
|---|---|---|---|
| 2f | Area shows little or no evidence of major disturbances by humans, such as livestock grazing or timber cutting, for the past 50 years. | YES - Very light recreation use, although FR 504 is built to passenger car standard. | |
| 2g | Area reflects its original, pristine condition as closely as possible. | YES - Wildcat Canyon excluded from grazing since 1969. Very small portion of west side of canyon is part of Long Tom Sheep Allotment. | NO - Potato fire (2006) burned about 1/3 of the RNA to some level. Fences are to be reconstructed in 2009 to isolate from Heber Allotment. The area was burned again during the Durfee fire in 2009. Light grazing occurred in 2007 within Wildcat RNA in area south of 504. Road due to downed fence. No longer had an outstanding example of undisturbed old growth Colorado piñon-Utah juniper woodland as originally intended. |
| 2h | 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 - Probably the best example of old persistent piñon-juniper woodland – Mullein, weeping lovegrass and cheatgrass most likely along roads. Wildcat Creek is assessed in Proper Functioning Condition. Easy access for research. | |
| **Summary and Need for Change – YES - Withdraw Proposed Wildcat Research Natural Area Recommendation - area burned and is no longer an outstanding example of undisturbed old growth Colorado piñon-Utah juniper woodland as originally intended. In addition, this proposed Research Natural Area has not been acted upon since its recommendation in 1987.** | | | |



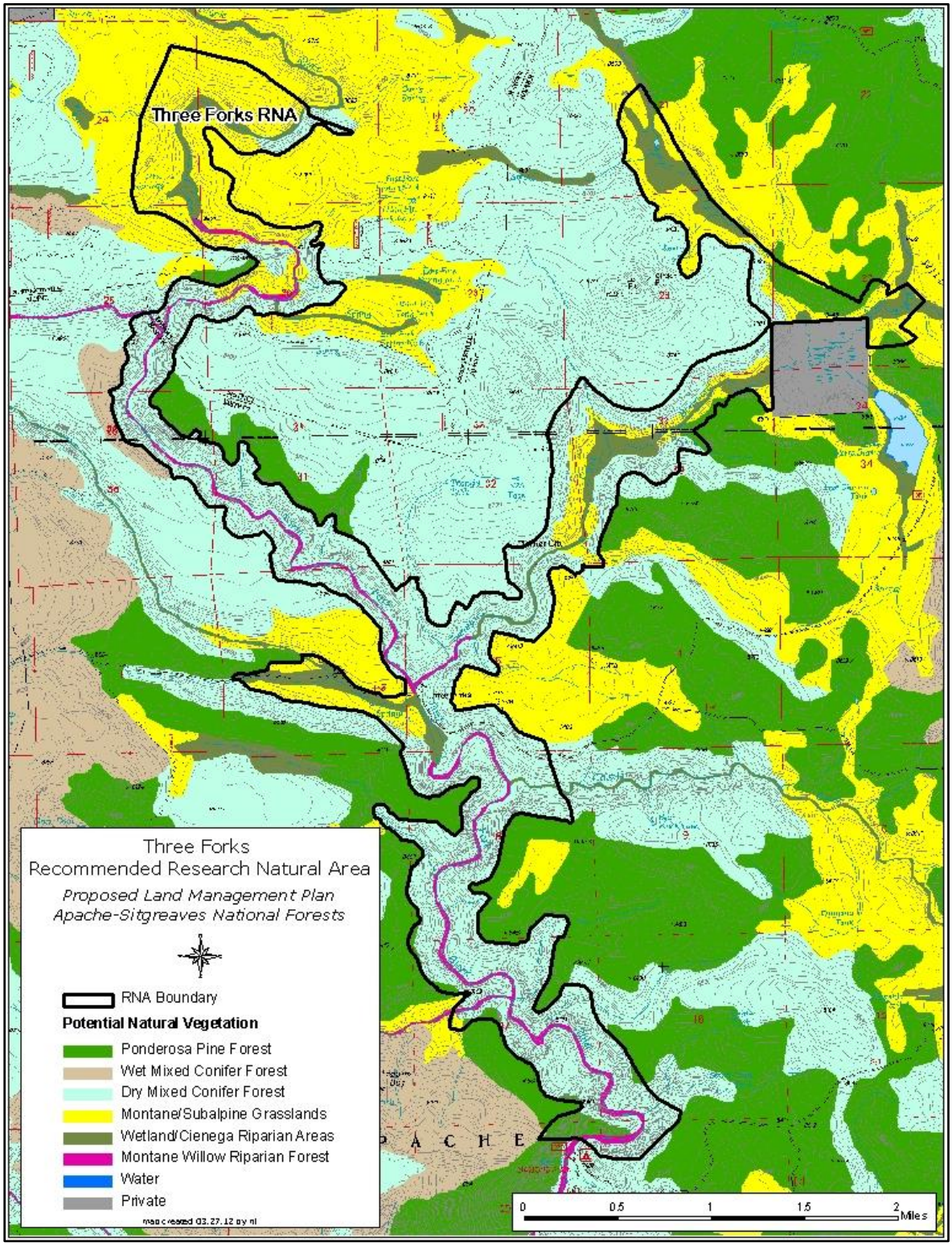

**Appendix A map 5. Currently recommended Wildcat Research Natural Area and potential natural vegetation types. It is now recommended to withdraw this proposed Research Natural Area**

**Appendix A table 6. Evaluation of the newly recommended Three Forks Research Natural Area (see appendix A map 6)**

| Step | Review of Representative Ecological Conditions<br>criteria | Potential Three Forks Research Natural Area<br>YES<br>(state justification if necessary due to circumstances) | Proposed Size (2,900 acres)<br>NO<br>(state justification) |
|---|---|---|---|
| 1 | Review RNA Representative Assessment Spreadsheet<br>a. 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?<br>b. Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br>c. If you have previously proposed RNAs in your current Forest Plan, do they fall within PNVT classes with rankings of 2 or 3? | YES - Wetland/cienega riparian areas (WCRA) (239 ac.) = (2), Montane willow riparian forest (MWRF) (2), Ponderosa pine forest (PPF) (113 ac.) = 2, and Unique aquatic habitat (fens) (3). Also contains a component of MWRF (although doesn't appear on mid-scale vegetation data due to mapping scale) | NO - Dry mixed conifer forest (DMCF) (1,828 ac.) = (1), Wet mixed conifer forest (WMCF) on slopes (1) and Montane/subalpine grasslands (MSG) (721 ac.) |
| 2 | Use the Conditions listed below to determine if these low-representative PNVT class areas or aquatic habitats are appropriate for RNA establishment | State reason why the area meets the criterion | State reason why the area does not meet the criterion |
| 2a | 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 - Most portions are Wild River eligible, Scenic eligible at road crossings and in bogs. Several bogs/fens/wetlands within area | |
| 2b | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species. | YES - California Floater, Three Forks springsnail, loach minnow, Chiricahua leopard frog, bighorn sheep, Mexican gray wolf, New Mexico meadow jumping mouse, narrowheaded gartersnake, northern Mexican gartersnake, Blumer's dock | |
| 2c | 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 - Unique area of fens, bogs, wetlands, and perennial streams bordered by WMCF. 59 percent of this area was burned during the 2011 Wallow fire. As much as 13 percent in the moderate and high severity categories. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |
| 2d | Area serves as a control area for comparing results from manipulative research. | YES - Area is already excluded from grazing since 1998. 59 percent of this area was burned during the 2011 Wallow fire. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |

**Appendix A table 6. Continued**

| Step | Review of Representative Ecological Conditions | Potential Three Forks Research Natural Area | Proposed Size (2,900 acres) |
|---|---|---|---|
| | criteria | YES (state justification if necessary due to circumstances) | NO (state justification) |
| 2e | 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 - Over 1,000 acres for unique research opportunities, especially in Arizona – large portion of headwater stream channels | |
| 2f | Area shows little or no evidence of major disturbances by humans, such as livestock grazing or timber cutting, for the past 50 years. | | NO - Area is already excluded from grazing since 1995 - portion closed to all entry since late 2001. Rest of area is closed to motorized vehicles since 1980s. |
| 2g | Area reflects its original, pristine condition as closely as possible. | YES - Due to closures, area is in relatively pristine condition – fens/bogs especially important and unique. | NO - 59 percent of this area was burned during the 2011 Wallow fire. |
| 2h | 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 - Currently excluded from livestock grazing, and includes rare endemic species, rare fens, and large contiguous area of perennial streams and wetlands/cienegas. Also, very accessible for research. | NO - Exotic crayfish, bull thistle, mullein, musk thistle should be targeted for research in eradication |
| **Summary and Need for Change – YES – Proposed Three Forks Research Natural Area Recommended. This area is extremely unique for Arizona, hydrologically, physically and biologically.** | | | |



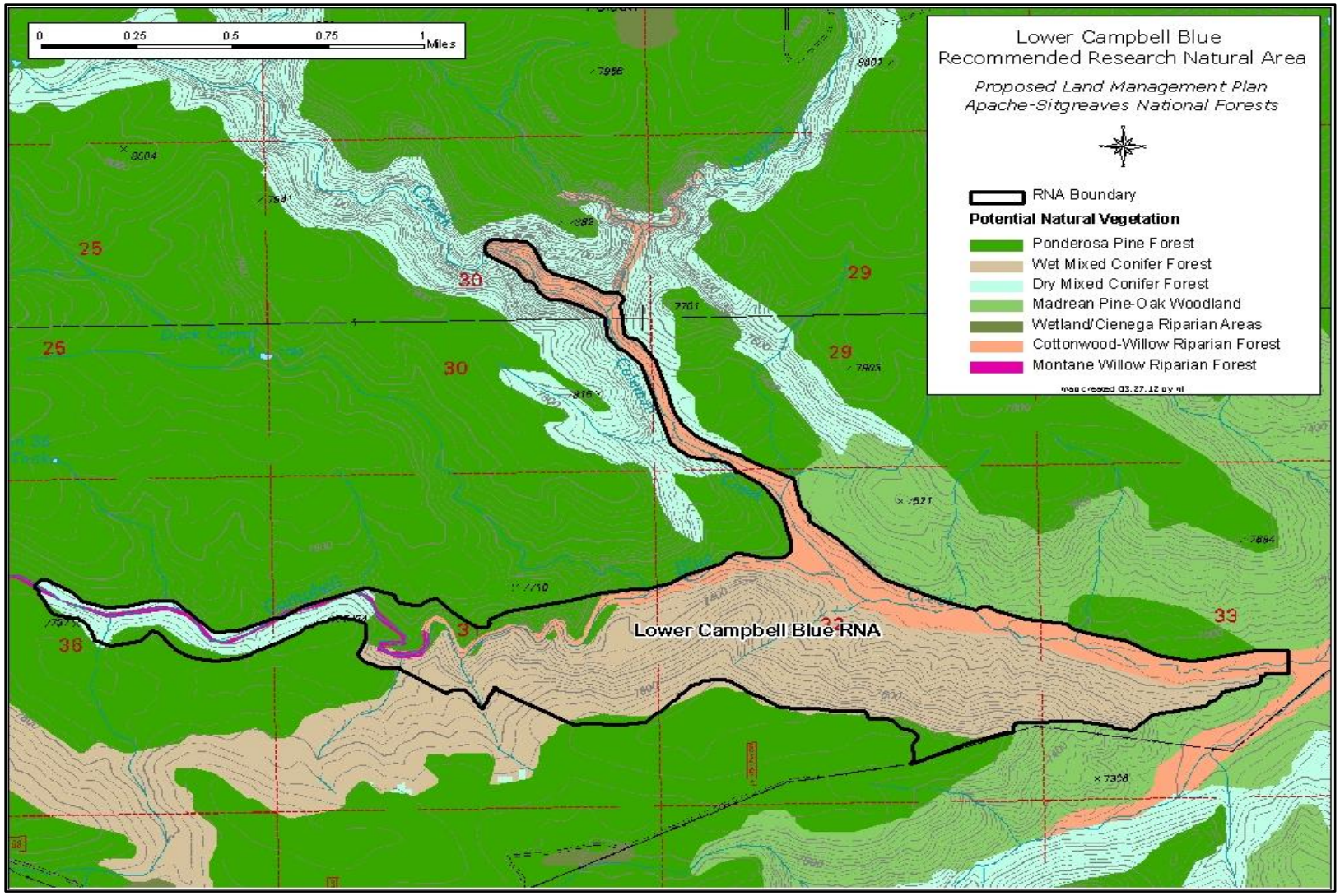

**Appendix A map 6. Newly recommended Three Forks Research Natural Area and potential natural vegetation types. The majority of the montane willow riparian forest potential natural vegetation type parallel to Boneyard and Coyote Creeks does not appear at the map scale presented**

**Appendix A table 7. Evaluation of the newly recommended Lower Campbell Blue Research Natural Area (see appendix A map 7)**

| Step | Review of Representative Ecological Conditions | Potential Lower Campbell Blue Research Natural Area | Proposed Size (580 acres [riparian corridor for 5 miles]) |
|---|---|---|---|
| | criteria | YES (state justification if necessary due to circumstances) | NO (state justification) |
| 1 | Review RNA Representative Assessment Spreadsheet<br>a. 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?<br>b. Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br>c. If you have previously proposed RNAs in your current Forest Plan, do they fall within PNVT classes with rankings of 2 or 3? | YES - Cottonwood-willow riparian forest (CWRF) (131 ac.) = (2), Ponderosa pine forest (PPF) (61 ac.) = (2), and springs and perennial creek | NO - Dry mixed conifer forest (DMCF) (387 ac.) = (1) |
| 2 | Use the Conditions listed below to determine if these low-representative PNVT class areas or aquatic habitats are appropriate for RNA establishment | State reason why the area meets the criterion | State reason why the area does not meet the criterion |
| 2a | 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 - High quality riparian vegetation example. Portion of an Apache trout recovery stream (Coleman Creek.), Wild and Scenic River Eligible, Designated and occupied critical loach minnow habitat. Old growth present | |
| 2b | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species. | YES - New Meadow jumping mouse, loach minnow, Mexican spotted owl, Mexican gray wolf, narrowheaded gartersnake, northern Mexican gartersnake, Gila trout (potential), Apache trout, beaver | |
| 2c | 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 - Ungrazed riparian habitat. 93 percent of this area was burned during the 2011 Wallow fire. As much as 80 percent in the moderate and high severity categories. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |
| 2d | Area serves as a control area for comparing results from manipulative research. | YES - Ungrazed riparian habitat. 93 percent of this area was burned during the 2011 Wallow fire. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |

**Appendix A table 7. Continued**

| Step | Review of Representative Ecological Conditions | Potential Lower Campbell Blue Research Natural Area | Proposed Size (580 acres [riparian corridor for 5 miles]) |
|---|---|---|---|
| | criteria | YES (state justification if necessary due to circumstances) | NO (state justification) |
| 2e | 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 - Very large initial area – site-specific boundaries need to be drawn– Entire small drainage to private property - little recreation access. No defined trail. | |
| 2f | Area shows little or no evidence of major disturbances by humans, such as livestock grazing or timber cutting, for the past 50 years. | YES - Little evidence of extensive grazing except for about one mile from west end. | NO - First mile from west still shows evidence of historic grazing. |
| 2g | Area reflects its original, pristine condition as closely as possible. | YES - Canyon itself is relatively pristine | NO - 93 percent of this area was burned during the 2011 Wallow fire. |
| 2h | 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 - One of the few riparian areas with beaver still present, canyon is nearly pristine and is naturally protected from human disturbance. Road on either end for research access. Old growth on side slopes and uplands | NO - Crayfish and bull frogs present |
| **Summary and Need for Change – YES - Proposed Lower Campbell Blue Research Natural Area Recommended.** | | | |



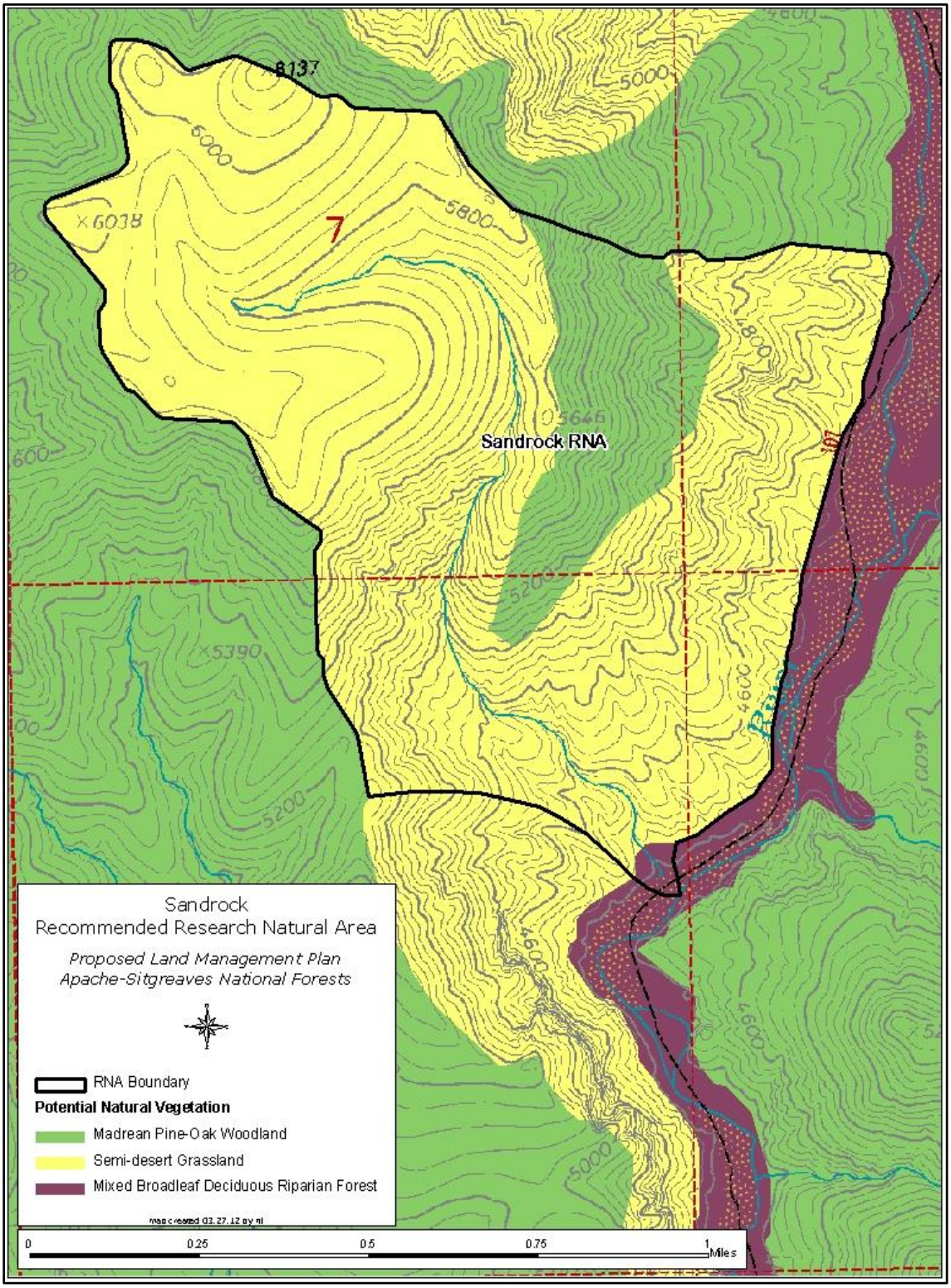

**Appendix A map 7. Newly recommended Lower Campbell Blue Research Natural Area and potential natural vegetation types. The majority of the montane willow riparian forest potential natural vegetation type parallel to Coleman and Campbell Blue Creeks does not appear at the map scale presented**

**Appendix A table 8. Evaluation of the newly recommended Sandrock Research Natural Area (see appendix A map 8)**

| Step | Review of Representative Ecological Conditions | Potential Sandrock Research Natural Area | Proposed Size (530 acres) |
|---|---|---|---|
| | criteria | YES (state justification if necessary due to circumstances) | NO (state justification) |
| 1 | Review RNA Representative Assessment Spreadsheet<br>a. 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?<br>b. Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br>c. If you have previously proposed RNAs in your current Forest Plan, do they fall within PNVT classes with rankings of 2 or 3? | YES - Semi-desert grasslands (SDG) are in category 2. Also contains Madrean pine-oak woodland (MPOW) and a small component of mixed broadleaf deciduous riparian forest (MBDRF) | |
| 2 | Use the Conditions listed below to determine if these low-representative PNVT class areas or aquatic habitats are appropriate for RNA establishment | State reason why the area meets the criterion | State reason why the area does not meet the criterion |
| 2a | 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 proposed RNA falls within a specific vegetation type, semi-desert grassland that has been identified as an underrepresented in the RNA system. This type represents about 5 percent of the total forests acreage, and about 14 percent of the semi-desert grassland within the Ecoregion. Semi-desert grassland (453 acres), MPOW (74 acres), and MBDRF (6 acres) along the Blue River | |
| 2b | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species. | YES - Contributes to the continued existence of this grassland type containing a variety of native grasses and forbs. Northern Mexican gartersnake, narrowheaded gartersnake, western yellow-billed cuckoo | |
| 2c | 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 - Good example of an area that could be used to evaluate the recovery of depleted rangeland | |
| 2d | Area serves as a control area for comparing results from manipulative research. | YES - Good example of an area that could be used to evaluate the recovery of depleted rangeland | |

**Appendix A table 8. Continued**

| Step | Review of Representative Ecological Conditions | Potential Sandrock Research Natural Area | Proposed Size (530 acres) |
|---|---|---|---|
| | criteria | YES (state justification if necessary due to circumstances) | NO (state justification) |
| 2e | 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 - Approximately 290 acres, and includes the watershed of an entire 1st order ephemeral drainage. Elevations range from approximately 4,400 to 6,100 feet. Topography ranges from strongly sloping ridges to steep mountain side-slopes with N, NE and E aspects. Currently, no fencing is necessary to protect this proposed RNA as the allotment is currently closed to grazing. The area is within an inventoried roadless area, has no formal trails, with potential to become wilderness. | If grazing is assigned, fencing will be necessary. |
| 2f | Area shows little or no evidence of major disturbances by humans, such as livestock grazing or timber cutting, for the past 50 years. | YES - This area has been excluded from permitted livestock grazing for 25 years. Estimated range condition is good and fair over 75 percent of the watershed; the remainder has not been assigned range condition. The presence of roads, trails and other developments are minimal or nonexistent. The area invites little or no recreational use other than an occasional hunter. | The allotment has been closed to permitted livestock grazing for 25 years. |
| 2g | Area reflects its original, pristine condition as closely as possible. | YES - For southwestern semi-desert grassland | |
| 2h | 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 is the best available site for semi-desert grassland that exists on the Forests. With current management and its remote location, disturbance would be minimal. Uplands are estimated to be noxious weed free. | Saltcedar may be present along the Blue River at the mouth of the watershed within the proposed RNA. |
| **Summary and Need for Change – YES - Proposed Sandrock Research Natural Area Recommended.** | | | |



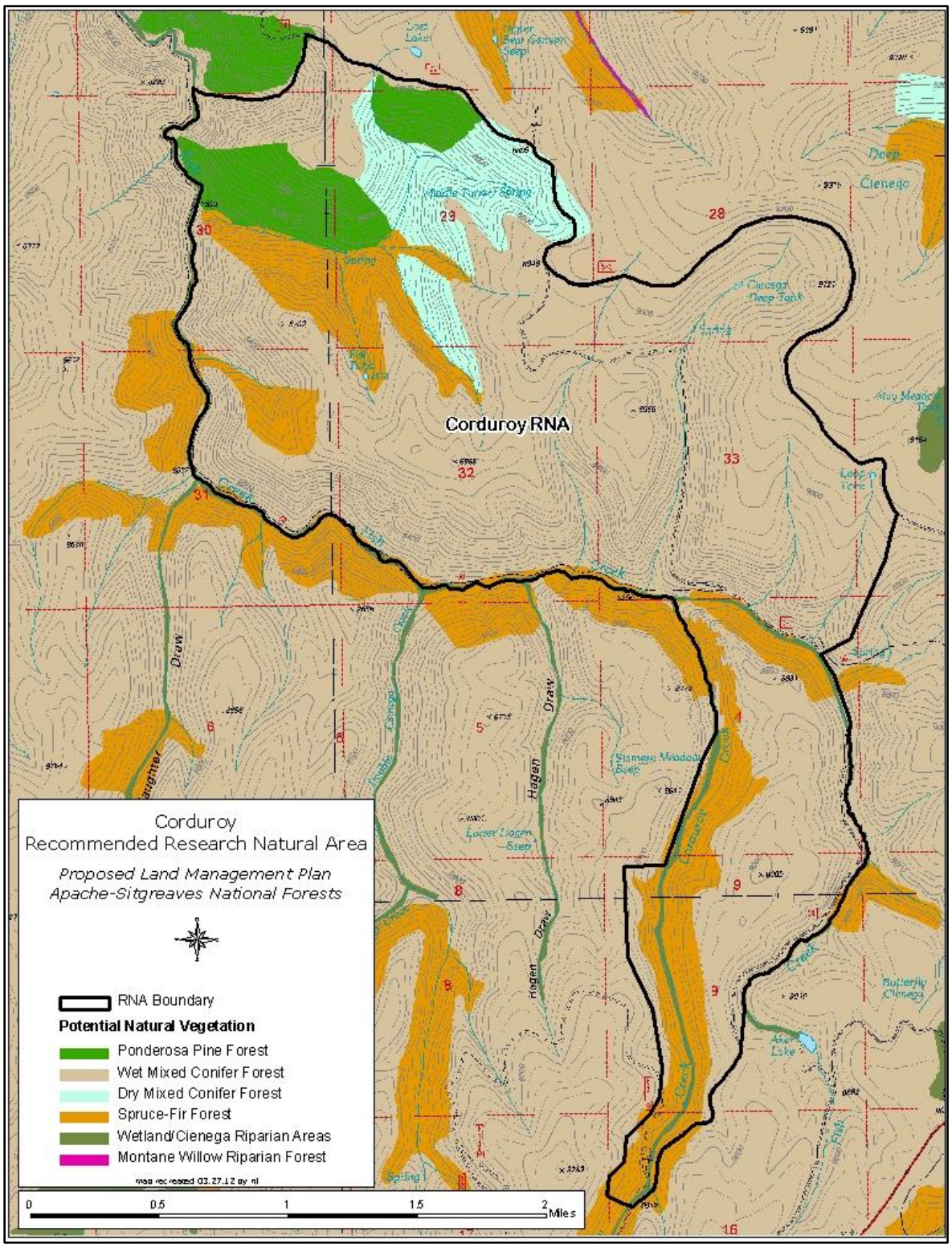

**Appendix A map 8. Newly recommended Sandrock Research Natural Area and potential natural vegetation types**

**Appendix A table 9. Evaluation of the newly recommended Corduroy Research Natural Area (appendix A map 9)**

| Step | Review of Representative Ecological Conditions | Potential Corduroy Research Natural Area | Proposed Size (3,350 acres) |
|---|---|---|---|
| | criteria | YES<br>(state justification if necessary due to circumstances) | NO<br>(state justification) |
| 1 | Review RNA Representative Assessment Spreadsheet<br>a. 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?<br>b. Is there an outstanding example of an aquatic habitat that may be appropriate as a potential RNA?<br>c. If you have previously proposed RNAs in your current Forest Plan, do they fall within PNVT classes with rankings of 2 or 3? | YES - Ponderosa pine forest (PPF) = 2 (161 ac). Also contains Montane willow riparian forest = 2: along Fish Creek and Corduroy Creek. Both streams are listed as Apache Trout recovery streams. Fish Creek within the proposed RNA is classified as "scenic." Does not appear on mid-scale vegetation as quaking aspen (1,296 ac), specifically, is not listed as being represented within the RNA system. | Dry mixed conifer forest (DMCF) = 1 (158ac), Spruce-fir forest (SFF) = 1 (662 ac), and Wet mixed conifer forest (WMCF) = 1 (2,330 ac) |
| 2 | Use the Conditions listed below to determine if these low-representative PNVT class areas or aquatic habitats are appropriate for RNA establishment | State reason why the area meets the criterion | State reason why the area does not meet the criterion |
| 2a | 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 - Area contains representations of quaking aspen, DMCF, montane willow riparian forest, PPF, SFF, and WMCF, and associated species. | |
| 2b | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species. | YES - The area contains the following wildlife species with viability concerns: Mew Mexico meadow jumping mouse, Apache trout, Mexican gray wolf, Mexican spotted owl, and northern goshawk. The area also contains the following plant species with viability concerns: bittercress ragwort, corkbark fir, fairy slipper, Goodding's onion, green death camas, Huachuca Mtn. stonecrop, Parry's thistle, quaking aspen, starry false lily of the valley, timberland blue-eyed grass, western spruce dwarf mistletoe, and yellow Jacob's-ladder. | |
| 2c | 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 - Potential for comparing affects of various management activities, wildfire effects, 89 percent of this area was burned during the 2011 Wallow fire. As much as 76 percent in the moderate and high severity categories, wildlife impacts, climate change, and long-term ecological processes on regeneration and survival of quaking aspen. Area is currently within two vacant grazing allotments. | |

**Appendix A table 9. Continued**

| Step | Review of Representative Ecological Conditions<br>criteria | Potential Corduroy Research Natural Area<br>YES<br>(state justification if necessary due to circumstances) | Proposed Size (3,350 acres)<br>NO<br>(state justification) |
|---|---|---|---|
| 2d | Area serves as a control area for comparing results from manipulative research. | YES - Potential for comparing affects of various management activities, wildfire effects, wildlife impacts (there is high elk use in the area, which is one factor needing study in relation to quaking aspen regeneration and survival), climate change, and long-term ecological processes on regeneration and survival of quaking aspen. Area is currently within two vacant grazing allotments. The area provides both no-treatment control sites, as well as management test opportunities. | |
| 2e | 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 area is approximately 3,310 acres in size, with roughly 1,296 ac containing quaking aspen. Quaking aspen is found on a variety of topographic positions; from steep slopes to gentle undulating ridge tops, as well as on all aspects. The area also contains a portion of both Fish and Corduroy Creeks. | |
| 2f | Area shows little or no evidence of major disturbances by humans, such as livestock grazing or timber cutting, for the past 50 years. | | NO - Area has experienced timber management activities, livestock grazing (none since 1995), Fish Creek has a hiking trail along its length, and there is a road within the proposed boundaries. As well as being a significant portion of the east and north boundary, Forest Road 24 traverses a portion of the area. |
| 2g | Area reflects its original, pristine condition as closely as possible. | | NO - Area has experienced timber management activities, livestock grazing (none since 1995), Fish Creek has a hiking trail along its length, and there is a road within the proposed boundaries. As well as being a significant portion of the east and north boundary, Forest Road 24 traverses a portion of the area. 89 percent of this area was burned during the 2011 Wallow fire. As much as 76 percent in the moderate and high severity categories. |
| 2h | 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 because in contains large acreages of aspen in four forest types, is easily accessible, and is not in conflict with livestock grazing or developed recreation. The area does contain minimal infestations of, or an occasional mullein, bull thistle, redstem filaree, oxeye daisy, and purslane. | |
| **Summary and Need for Change – YES - Proposed Corduroy Research Natural Area Recommended.** | | | |




**Appendix A map 9. Newly recommended Corduroy Research Natural Area and potential natural vegetation types. The montane willow riparian forest potential natural vegetation type parallel to Corduroy and Fish Creeks does not appear at the map scale presented**