United States
Department of
Agriculture

Forest
Service

**Southwestern
Region**

# Research Natural Areas Specialist Report

## Forest Plan Revision DEIS


**Submitted by:** /s/ *Mitchel R. White*
Mitchel R. White, Ph.D.
Ecologist

/s/ *Michelle W. Davalos*
Michelle W. Davalos
Forest Planner


March 26, 2012

## Contents

# Specialist Report..... 3


**Introduction** ..... 3
**Relevant Laws, Regulations, and Policy that Apply** ..... 3
**Methodology and Analysis Process** ..... 3
**Assumptions** ..... 4
**Revision Topics Addressed in this Analysis** ..... 4
**Summary of Alternatives** ..... 4
**Description of Affected Environment (Existing Condition)** ..... 5
**Environmental Consequences** ..... 9
**Cumulative Environmental Consequences** ..... 11
**Adaptive Management** ..... 11
**Other Planning Efforts** ..... 12
**References** ..... 12
**Appendix A: RNA Evaluations** ..... 13
**Appendix B: RNA Maps** ..... 34

Table 1. List of ecological types (potential natural vegetation types) that are lacking representation in the regionwide RNA system. Shaded cells indicate those ecological types that occur on the Apache-Sitgreaves NFs. ..... 5
Table 2. Results of the Apache-Sitgreaves NFs RNA Evaluation. ..... 7
Table 3. Number and amount of designated and recommended RNAs by alternative. ..... 10
Table 4. Status of grazing allotments containing recommended RNAs. ..... 10

Appendix A, Table 1. Evaluation of Phelps Cabin RNA. ..... 14
Appendix A, Table 2. Evaluation of Recommended Hayground RNA. ..... 16
Appendix A, Table 3. Evaluation of Recommended Escudilla Mountain RNA. ..... 19
Appendix A, Table 4. Evaluation of Recommended Thomas Creek RNA. ..... 21
Appendix A, Table 5. Evaluation of Recommended Wildcat RNA. ..... 23
Appendix A, Table 6. Evaluation of Recommended Three Forks RNA. ..... 25
Appendix A, Table 7. Evaluation of Recommended Lower Campbell Blue. ..... 27
Appendix A, Table 8. Evaluation of Recommended Sandrock RNA. ..... 29
Appendix A, Table 9. Evaluation of Recommended Corduroy RNA. ..... 31

Appendix B, Figure 1. Map of Phelps Cabin RNA, Phelps Botanical Area, and Potential Natural Vegetation Types. It is recommended to add the botanical area to the Phelps Cabin RNA. ..... 35
Appendix B, Figure 2. Map of currently recommended Hayground RNA and Potential Natural Vegetation Types. It is now recommended to withdraw this area. ..... 36
Appendix B, Figure 3. Map of currently recommended Escudilla Mountain RNA and Potential Natural Vegetation Types. It is now recommended to withdraw this area. ..... 37
Appendix B, Figure 4. Map of currently recommended Thomas Creek RNA and Potential Natural Vegetation Types. It is proposed to retain the recommendation. ..... 38
Appendix B, Figure 5. Map of currently recommended Wildcat RNA and Potential Natural Vegetation Types. It is now recommended to withdraw this area. ..... 39
Appendix B, Figure 6. Map of newly recommended Three Forks RNA and Potential Natural Vegetation Types. ..... 40
Appendix B, Figure 7. Map of newly recommended Lower Campbell Blue RNA and Potential Natural Vegetation Types. ..... 41
Appendix B, Figure 8. Map of newly recommended Sandrock RNA and Potential Natural Vegetation Types. ..... 42
Appendix B, Figure 9. Map of newly recommended Corduroy RNA and Potential Natural Vegetation Types. ..... 43

# Specialist Report

## Introduction

This report evaluates and discloses the potential environmental consequences on the special area: research natural area (RNA) 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 (ASNFs) 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 ASNFs followed the regional work group process *Research Natural Area Process for Forest Plan Revision under the 1982 Planning Rule Provisions* (Forest Service 2009). 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).

[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.

**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 2010). 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. 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.
- 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 2010) 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 2008b).

**Table 1. List of ecological types (potential natural vegetation types) that are lacking representation in the regionwide RNA system. Shaded cells indicate those ecological types that occur on the Apache-Sitgreaves NFs.**

| Ecological Types (Potential Natural Vegetation Types) | | | |
|---|---|---|---|
| Alpine and Tundra | Cottonwood-Willow | Gallery Coniferous | Gambel Oak Shrubland |

| | | | |
|---|---|---|---|
| | Riparian Forest (CWRF) | Riparian Forest | |
| 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) |

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

Currently, the ASNFs have one designated RNA, Phelps Cabin, and one designated botanical area, Phelps Cabin Botanical Area (Appendix B, figure 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).

The forest has one botanical area (Appendix B, figure 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 ASNFs. 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 B, figure 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).

**Table 2. Results of the Apache-Sitgreaves NFs RNA Evaluation.**

| Name | Status | Size (acres) | Ecological types (PNVTs) that are needed in the regionwide RNA System | | | | | | Recommend or Withdraw |
|---|---|---|---|---|---|---|---|---|---|
| | | | CWRF | MWRF | PJW | PPF | SDG | WCRA | |
| Phelps Cabin | Existing designated RNA | 290 | | X | | | | X | **Recommend** with addition of the Phelps Botanical Area |
| Hayground | Recommended in the 1987 forest plan | 400 | | X | | | | X | **Withdraw** recommendation, ecological representation found in other designated and recommended RNAs. |
| 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. |
| 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. |
| 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. |
| Three Forks | Evaluated during plan revision | 2,900 | | X | | X | | X | **Recommend**, this area also contains unique aquatic habitat (fens) and wildlife species. |
| Lower Campbell Blue | Evaluated during plan revision | 580 | X | | | X | | | **Recommend**, this area also contains springs and perennial creeks. |
| Sandrock | Evaluated during plan revision | 530 | | | | | X | | **Recommend** |
| Corduroy | Evaluated during plan revision | 3,350 | | X | | X | | | **Recommend**, this area also contains quaking aspen. |

The recommended Escudilla Mountain RNA (Appendix B, figure 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 B, figure 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 B, figure 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 B, figure 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 ASNFs 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 B, figure 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 B, figure 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 B, figure 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 ASNFs 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 ASNFs:

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).

## Environmental Consequences

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 as RNAs (table 3).

**Table 3. Number and amount of designated and recommended RNAs by alternative.**

| | 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 | < 1%[2] | < 1% | < 1% | < 1% |

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.

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, 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 RNAs.**

| 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. |

[2] Total forest acreage is over 2.1 million

| | |
|---|---|
| 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 until 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). 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 ASNFs 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 ASNFs 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


Forest Service. 1984. Progress Report Research Natural Areas. USDA Forest Service, Southwestern Region. Albuquerque, New Mexico.

Forest Service. 1987. Apache-Sitgreaves National Forests Plan (as amended). USDA Forest Service, Southwestern Region. Albuquerque, New Mexico.

Forest Service. 2005. Forest Service Manual 4060. USDA Forest Service, National Headquarters (WO). Washington D.C.

Forest Service. 2008. Ecological Sustainability Report Apache-Sitgreaves National Forests. USDA Forest Service Southwestern Region. Springerville, Arizona.

Forest Service. 2008a. Forest Plan Revision Resource Evaluations Apache-Sitgreaves National Forests. USDA Forest Service Southwestern Region. Springerville, Arizona.

Forest Service. 2008b. PNVT Summary – R3 All Lands Spreadsheet. RNA Work Group. USDA Forest Service, Southwestern Region. Albuquerque, New Mexico.

Forest Service. 2009. Research Natural Area Process for Forest Plan Revision under the 1982 Planning Rule Provisions. Southwestern Region RNA Work Group. USDA Forest Service, Southwestern Region. Albuquerque, New Mexico.

Forest Service. 2010. Research Natural Areas (RNAs) of the Apache-Sitgreaves NFs and the Revision of the Forest Plan. USDA Forest Service, Southwestern Region, Apache-Sitgreaves National Forests. Springerville, Arizona.

# Appendix A: RNA Evaluations

The full RNA evaluation can be found in *Forest Plan Revision Resource Evaluations Apache-Sitgreaves National Forests* (Forest Service 2010). Background on the process can be found in *Research Natural Area Process for Forest Plan Revision under the 1982 Planning Rule Provisions* (Forest Service 2009).

**Appendix A, Table 1. Evaluation of Phelps Cabin RNA.**

| | Review of RNA Management Direction | PHELPS CABIN RNA AND PHELPS BOTANICAL AREA | 300 acre RNA + 100 acre Botanical Area |
|---|---|---|---|
| **STEP** | **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.")<br>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.<br>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<br>Fishing is heavy along the East Fork Little Colorado River.<br>Increased ungulate (elk) herbivory threatens Arizona willow.<br>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 Research Natural Area 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 Research Natural Area was | YES: | Livestock grazing (herbivory) has been halted. Beaver are no longer occupying area. |

| | | | |
|---|---|---|---|
| | established to protect. | | |
| **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). | YES: Only the wilderness portion of the RNA has been withdrawn from mineral entry. | |
| | **Summary and Need for Change** | **YES: Recommend retaining RNA. Change boundary to include Phelps Botanical Area – carry over all existing LMP direction and implement it.** | |

**Appendix A, Table 2. Evaluation of Recommended Hayground RNA.**

| | Review of Representative Ecological Conditions | PROPOSED HAYGROUND RNA | 530 Acres |
|---|---|---|---|
| **STEP** | **Criteria** | **YES (state justification if necessary due to circumstances)** | **NO (state justification)** |
| **1** | **Review RNA Representative Assessment Spreadsheet** | | |
| | 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 (14 ac.) = 2<br>Montane/subalpine grasslands (5 ac) = 2<br>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. | Spruce-fir forest (blue spruce) (143 ac.) = 1<br>Wet mixed conifer forest (20 ac.) = 1<br>Dry mixed conifer forest 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 |
| | 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 Wetland/Cienega riparian type. Also, represents three Blue Spruce forest habitat types. | |
| | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species. | YES: Montane willows present, Allium gooddingii, Apache trout, American dipper | |
| | 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: Undisturbed Blue spruce forest with corkbark fir. Undisturbed compared with surrounding lands in terms of timber – is fenced except along the natural barriers. 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 | Is within the Black River Conservation Area – which provides resource protection. |

| | Review of Representative Ecological Conditions | PROPOSED HAYGROUND RNA | 530 Acres |
|---|---|---|---|
| | | opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |
| | Area serves as a control area for comparing results from manipulative research. | YES: Potential for comparing effects of grazing on wetland/cienegas, although small in size. Exclosures are fenced off from livestock and one from elk so have additional research opportunities. Current elk/livestock exclosures already built. Could be a control for blue spruce vegetation type, also. 98 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. | |
| | 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: Drainage is relatively undisturbed and naturally inaccessible due to steep canyons. | |
| | 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. | Upper end shows disturbance from livestock/ungulate grazing, but has been fenced from domestic grazing since the mid-1980s. |
| | Area reflects its original, pristine condition as closely as possible. | YES: Drainage only | Wetland/cienega is disturbed within last 25 years, but is now fenced. 98 percent of this area was burned during the 2011 Wallow fire. |
| | 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 representation of three (3) blue spruce habitat types on the Forest. Probably a few, but no documented occurrences of exotic invasive species. | It is like that this area contains crayfish, and bullfrogs. |
| | **Summary and Need for Change** | | **Withdraw recommendation – the regional-need ecological types (wetland/cienega and montane-willow riparian) are covered in other recommended RNAs. Also this area is within the** |

| | Review of Representative Ecological Conditions | PROPOSED HAYGROUND RNA | 530 Acres |
|---|---|---|---|
| | | | **Black River Conservation Area, which provides protections. This proposed RNA has not been acted upon since recommended in 1987.** |

**Appendix A, Table 3. Evaluation of Recommended Escudilla Mountain RNA.**

| | Review of Representative Ecological Conditions | PROPOSED ESCUDILLA MOUNTAIN RNA | 960 Acres |
|---|---|---|---|
| **STEP** | **Criteria** | **YES (state justification if necessary due to circumstances)** | **NO (state justification)** |
| **1** | Review RNA Representative Assessment Spreadsheet | | |
| | 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: –<br>Wetland/cienega riparian areas (59 ac.) = 2 | NO -<br>Dry mixed conifer forest (25 ac.) = 1<br>Wet mixed conifer forest (601 ac.) = 1<br>Spruce-fir forest (137 ac.) = 1<br>Montane/subalpine grasslands (140 ac.) = 1<br>No examples of outstanding riparian habitats |
| **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 <u>meets</u> the criterion | State reason why the area <u>does not meet</u> the criterion |
| | 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. | | 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. |
| | Area contributes or continues to contribute to the preservation and maintenance of genetic diversity, including threatened, endangered, aquatic systems, and sensitive species. | YES: Contains Allium gooddingii. | |
| | 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% in the moderate and high severity categories. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |

| | Review of Representative Ecological Conditions | PROPOSED ESCUDILLA MOUNTAIN RNA | 960 Acres |
|---|---|---|---|
| | 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. | |
| | 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 shows little or no evidence of major disturbances by humans, such as livestock grazing or timber cutting, for the past 50 years. | YES: | |
| | Area reflects its original, pristine condition as closely as possible. | 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. |
| | 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** | | **Withdraw recommendation- PNVTs within this area are well represented across the Region – plus, the area is already receiving protection as a Wilderness Area. This proposed RNA has not been acted upon since recommended in 1987.** |

**Appendix A, Table 4. Evaluation of Recommended Thomas Creek RNA.**

| | Review of Representative Ecological Conditions | PROPOSED THOMAS CREEK RNA | 550 Acres |
|---|---|---|---|
| **STEP** | **Criteria** | **YES (state justification if necessary due to circumstances)** | **NO (state justification)** |
| **1** | Review RNA Representative Assessment Spreadsheet | | |
| | 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 wet mixed conifer forest |
| **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 |
| | 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. | |
| | 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. | |
| | 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% in the moderate and high severity categories. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |

| | Review of Representative Ecological Conditions | PROPOSED THOMAS CREEK RNA | 550 Acres |
|---|---|---|---|
| | 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. | |
| | 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 | |
| | 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. | |
| | 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. | 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. |
| | 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. | |
| | | YES: 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** | **Recommend** | |

**Appendix A, Table 5. Evaluation of Recommended Wildcat RNA.**

| | Review of Representative Ecological Conditions | PROPOSED WILDCAT RNA | 530 acres |
|---|---|---|---|
| **STEP** | **Criteria** | **YES (state justification if necessary due to circumstances)** | **NO (state justification)** |
| **1** | Review RNA Representative Assessment Spreadsheet | | |
| | 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 (2)<br>Ponderosa pine forest (2) | Dry mixed conifer forest (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 |
| | 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 SW due to the long history of human use (grazing). | No longer meets original intent of providing undisturbed piñon-juniper – because of wildfires. |
| | 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, Mexican spotted owl – flora has not been thoroughly described, collected or studied. | |
| | 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 | |
| | Area serves as a control area for comparing results from | YES: No current studies – potential as a piñon- | No current studies |

| | Review of Representative Ecological Conditions | PROPOSED WILDCAT RNA | 530 acres |
|---|---|---|---|
| | manipulative research. | juniper control for treatments | |
| | 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 | |
| | 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. | |
| | 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. | 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. |
| | 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** | | **Withdraw recommendation – area burned and no longer an outstanding example of undisturbed old growth Colorado piñon-Utah juniper woodland as originally intended. This proposed RNA has not been acted upon since recommended in 1987.** |

**Appendix A, Table 6. Evaluation of Recommended Three Forks RNA.**

| | Review of Representative Ecological Conditions | POTENTIAL THREE FORKS RNA | 2,900 Acres |
|---|---|---|---|
| **STEP** | **Criteria** | **YES (state justification if necessary due to circumstances)** | **NO (state justification)** |
| **1** | **Review RNA Representative Assessment Spreadsheet** | | |
| | 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 (239 ac.) = (2)<br>Montane willow riparian forest (2)<br>Ponderosa pine forest (113 ac.) = 2<br>Unique aquatic habitat (fens) (3)<br>*also contains a component of montane willow riparian forest (although doesn't appear on mid-scale vegetation data) | Dry mixed conifer forest (1,828 ac.) = (1)<br>Wet mixed conifer forest on slopes (1)<br>Montane/subalpine grasslands (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 |
| | 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 | |
| | 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, Blumer's dock | |
| | 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 wet mixed conifer. 59 percent of this area was burned during the 2011 Wallow fire. As much as 13% in the moderate and high severity categories. This provides opportunities | |

| | Review of Representative Ecological Conditions | POTENTIAL THREE FORKS RNA | 2,900 Acres |
|---|---|---|---|
| | | to study soil stabilization processes and plant succession in relation to burn severity. | |
| | 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. | |
| | 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 | |
| | Area shows little or no evidence of major disturbances by humans, such as livestock grazing or timber cutting, for the past 50 years. | | 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. |
| | 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. | 59 percent of this area was burned during the 2011 Wallow fire. |
| | 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. | Exotic crayfish, bull thistle, mullein, musk thistle should be targeted for research in eradication |
| | **Summary and Need for Change** | **Recommended** | |

**Appendix A, Table 7. Evaluation of Recommended Lower Campbell Blue.**

| | Review of Representative Ecological Conditions | POTENTIAL LOWER CAMPBELL BLUE | 580 acres (corridor for 5 miles) |
|---|---|---|---|
| **STEP** | **Criteria** | **YES (state justification if necessary due to circumstances)** | **NO (state justification)** |
| **1** | **Review RNA Representative Assessment Spreadsheet** | | |
| | 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) (131 ac.) = (2)<br>Ponderosa pine forest (61 ac.) = (2)<br>springs, perennial creek | Dry mixed conifer forest (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 |
| | 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 | |
| | 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, Gila trout (potential), Apache trout, beaver | |
| | 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% in the moderate and high severity categories. This provides opportunities to study soil stabilization processes and plant succession in relation to burn severity. | |

| | Review of Representative Ecological Conditions | POTENTIAL LOWER CAMPBELL BLUE | 580 acres (corridor for 5 miles) |
|---|---|---|---|
| | 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. | |
| | 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. | |
| | 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. | First mile from west still shows evidence of historic grazing. |
| | Area reflects its original, pristine condition as closely as possible. | YES: Canyon itself is relatively pristine | 93 percent of this area was burned during the 2011 Wallow fire. |
| | 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 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 | Crayfish and bull frogs present |
| | **Summary and Need for Change** | **Recommended** | |

**Appendix A, Table 8. Evaluation of Recommended Sandrock RNA.**

| | Review of Representative Ecological Conditions | POTENTIAL SANDROCK RNA | 530 Acres |
|---|---|---|---|
| **STEP** | **Criteria** | **YES (state justification if necessary due to circumstances)** | **NO (state justification)** |
| **1** | **Review RNA Representative Assessment Spreadsheet** | | |
| | 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 are in category 2. | Also contains Madrean pine-oak woodland and a small component of mixed broadleaf deciduous riparian forest |
| **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 |
| | 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.<br>Semi-desert grassland (453 acres)<br>Madrean pine-oak woodland (74 acres)<br>Mixed broadleaf deciduous riparian forest (6 acres) along the Blue River | |
| | 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. | |

| | Review of Representative Ecological Conditions | POTENTIAL SANDROCK RNA | 530 Acres |
|---|---|---|---|
| | 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 | |
| | Area serves as a control area for comparing results from manipulative research. | YES: (see above) | |
| | 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. |
| | 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 domestic 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 authorized grazing for 25 years. |
| | Area reflects its original, pristine condition as closely as possible. | 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: This is the best available site for semi-desert grassland that exists on the Forest. With current management and its remote location, disturbance would be minimal. Uplands are estimated to be noxious weed free. | Tamarisk may be present along the Blue River at the mouth of the watershed within the proposed RNA. |
| | **Summary and Need for Change** | **Recommended** | |

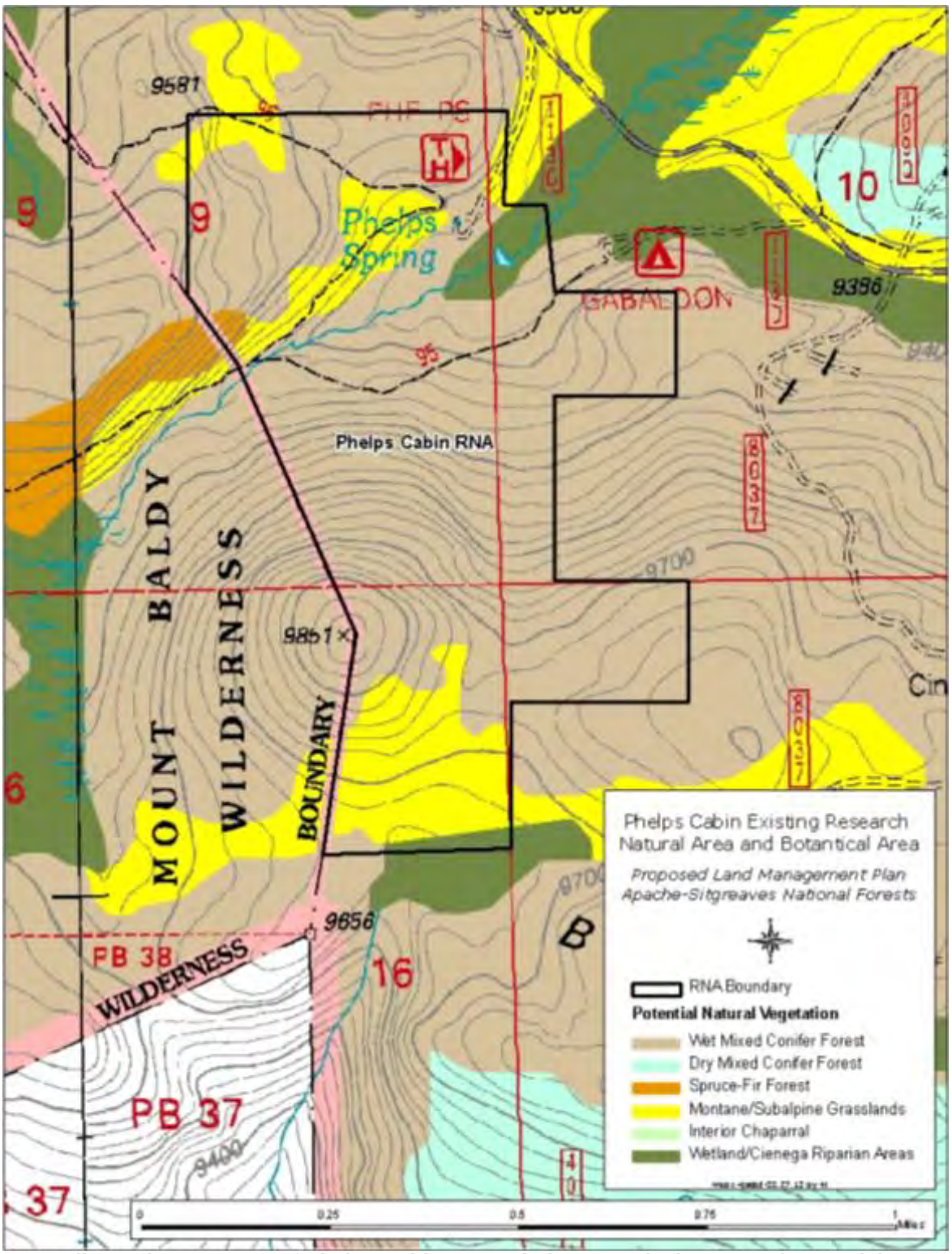
**Appendix A, Table 9. Evaluation of Recommended Corduroy RNA.**

| | Review of Representative Ecological Conditions | Potential Corduroy RNA | 3,350 Total Acres |
|---|---|---|---|
| **STEP** | **Criteria** | **YES (state justification)** | **NO (state justification)** |
| **1** | Review RNA Representative Assessment Spreadsheet | | |
| | 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 = 2 (161 ac).<br><br>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 = 1 (158ac)<br>Spruce-fir forest = 1 (662 ac)<br>Wet mixed conifer forest = 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 <u>meets</u> the criterion | State reason why the area <u>does not meet</u> the criterion |
| | 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, Dry mixed conifer forest, Montane willow riparian forest, Ponderosa pine forest, Spruce-fir forest, and Wet mixed conifer forest, and associated species. | |
| | 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: Apache trout (*Oncorhynchus gilae apache*), Mexican gray wolf (*Canis lupus baileyi*), Mexican spotted owl (*Strix occidentalis lucida*), and northern goshawk (*Accipiter gentilis*). The area also contains the following plant species with viability concerns: Bittercress ragwort (*Packera cardamine* (Greene) W.A. Weber & A. Löve), corkbark fir (*Abies lasiocarpa* (Hook.) Nutt. var. *arizonica* (Merriam) Lemmon), fairy slipper (*Calypso bulbosa* | |

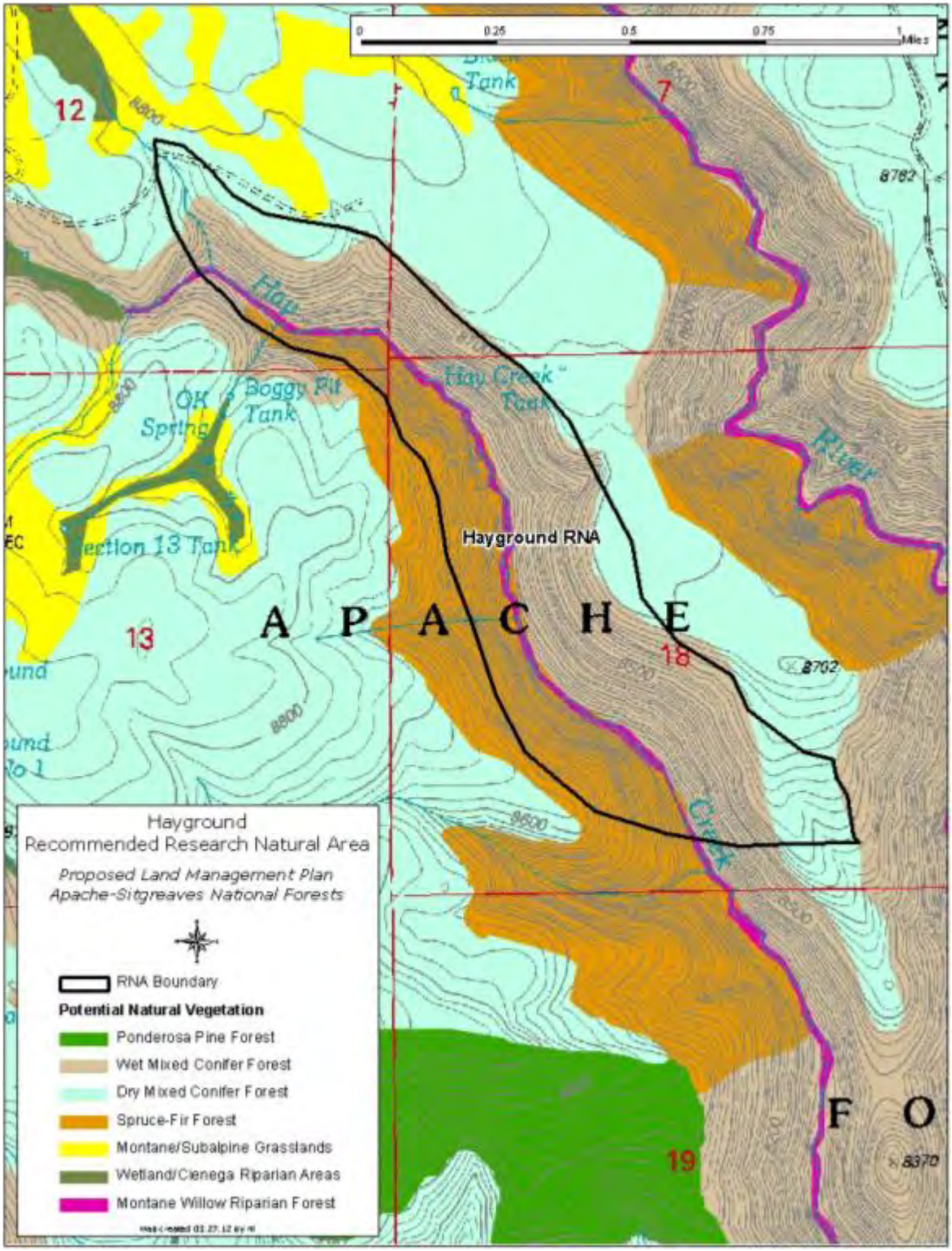
| | Review of Representative Ecological Conditions | Potential Corduroy RNA | 3,350 Total Acres |
|---|---|---|---|
| | | var. *americana* (R. Br. ex Ait. f.) Luer), Goodding's onion (*Allium gooddingii* Ownbey), green deathcamas (*Zigadenus virescens* (Kunth) J.F. Macbr.), Huachuca Mtn. stonecrop (*Sedum stelliforme* S. Watson), Parry's thistle (*Cirsium parryi* (A. Gray) Petr.), quaking aspen (*Populus tremuloides* Michx.), starry false lily of the valley (*Maianthemum stellatum* (L.) Link), timberland blue-eyed grass (*Sisyrinchium longipes* (E.P. Bicknell) Kearney & Peebles), western spruce dwarf mistletoe (*Arceuthobium microcarpum* (Engelm.) Hawksw. & Wiens), and yellow Jacob's-ladder (*Polemonium foliosissimum* var. *flavum* (Greene) Anway). | |
| | 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% 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. | |
| | 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. | |
| | 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, | 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 ridgetops, as well as on all aspects. The area also | |

| | Review of Representative Ecological Conditions | Potential Corduroy RNA | 3,350 Total Acres |
|---|---|---|---|
| | 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. | contains a portion of both Fish and Corduroy Creeks. | |
| | 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. |
| | 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% in the moderate and high severity categories. |
| | 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** | **Recommended** | |

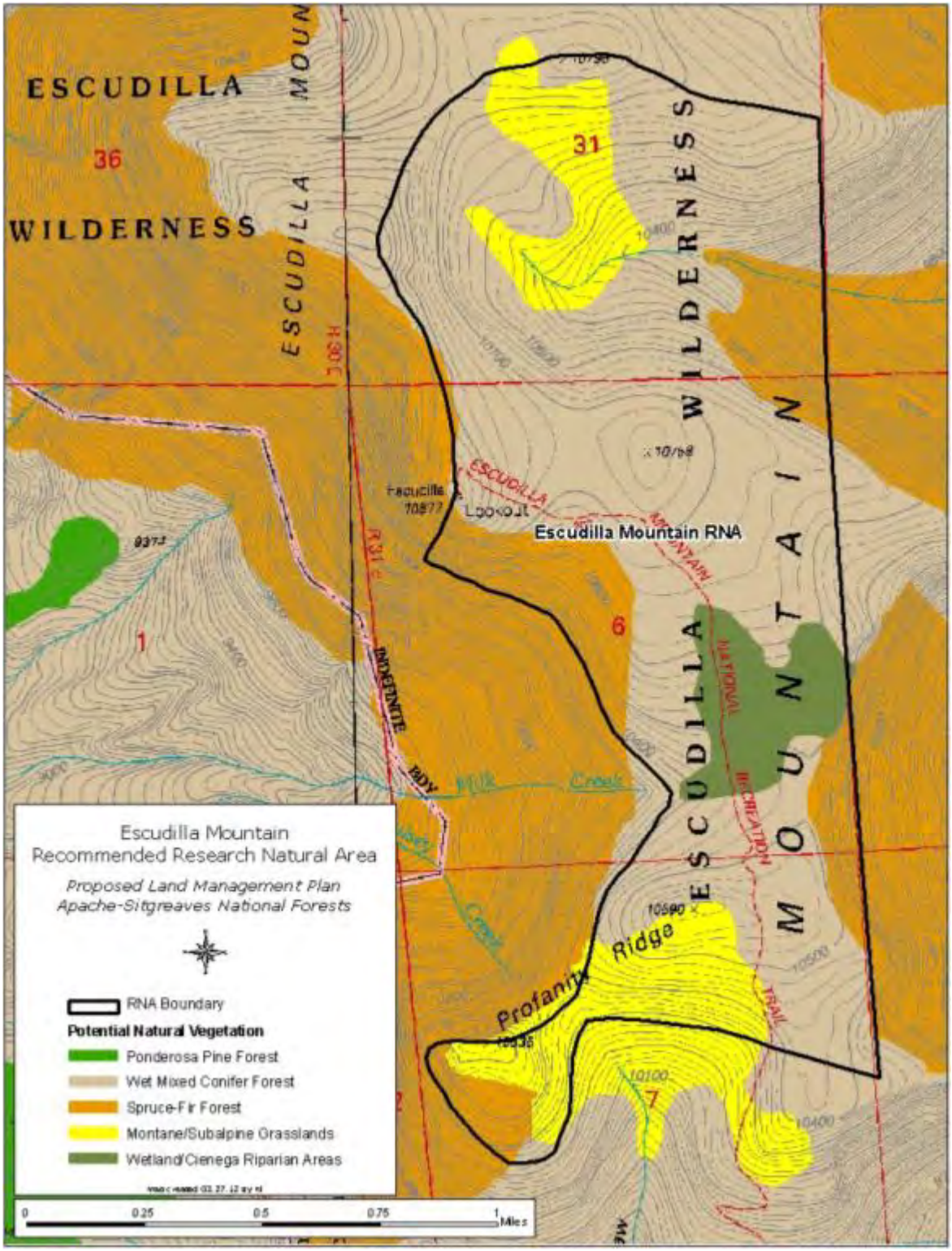
# Appendix B: RNA Maps



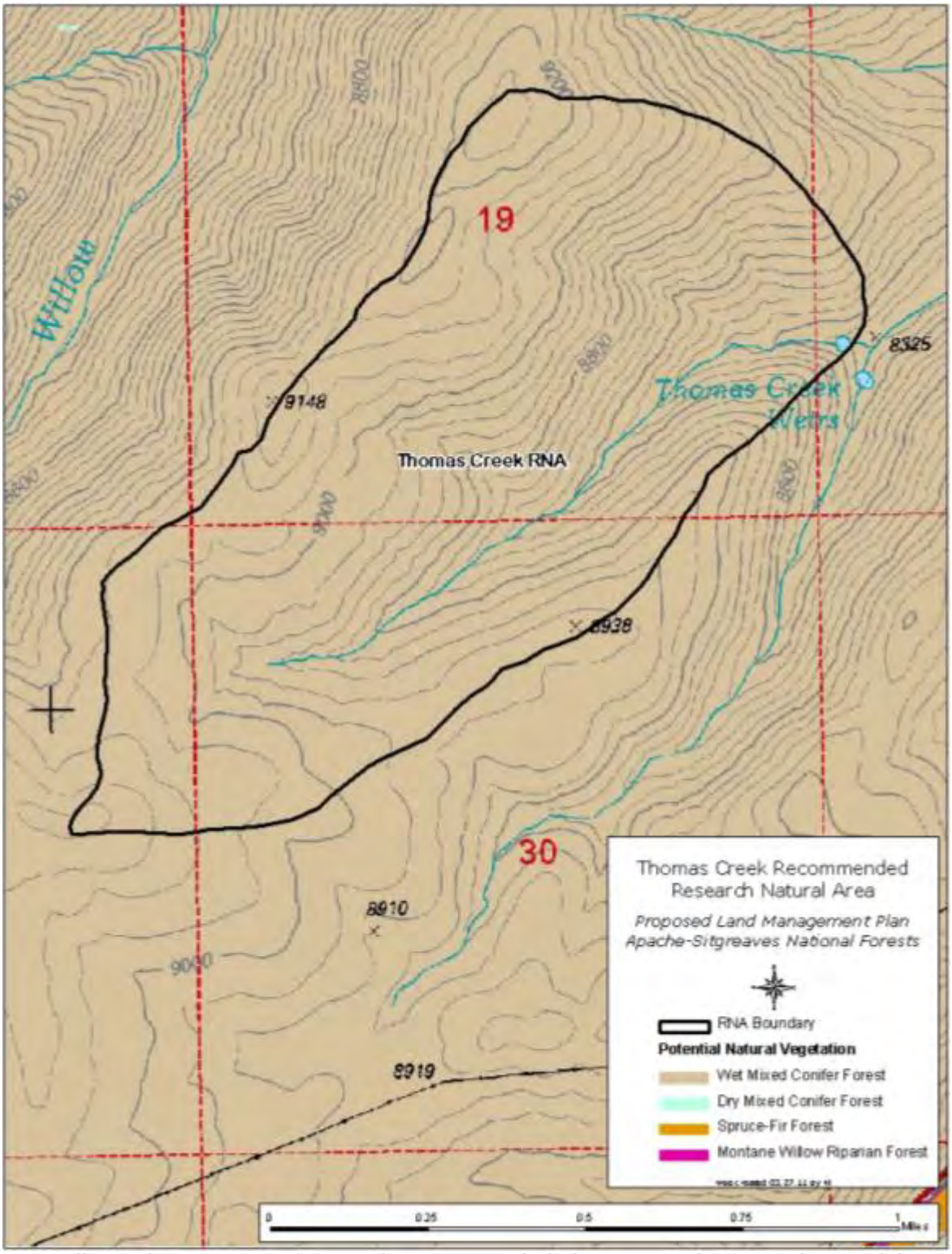

**Appendix B, Figure 1. Map of Phelps Cabin RNA, Phelps Botanical Area, and Potential Natural Vegetation Types. It is recommended to add the botanical area to the Phelps Cabin RNA.**



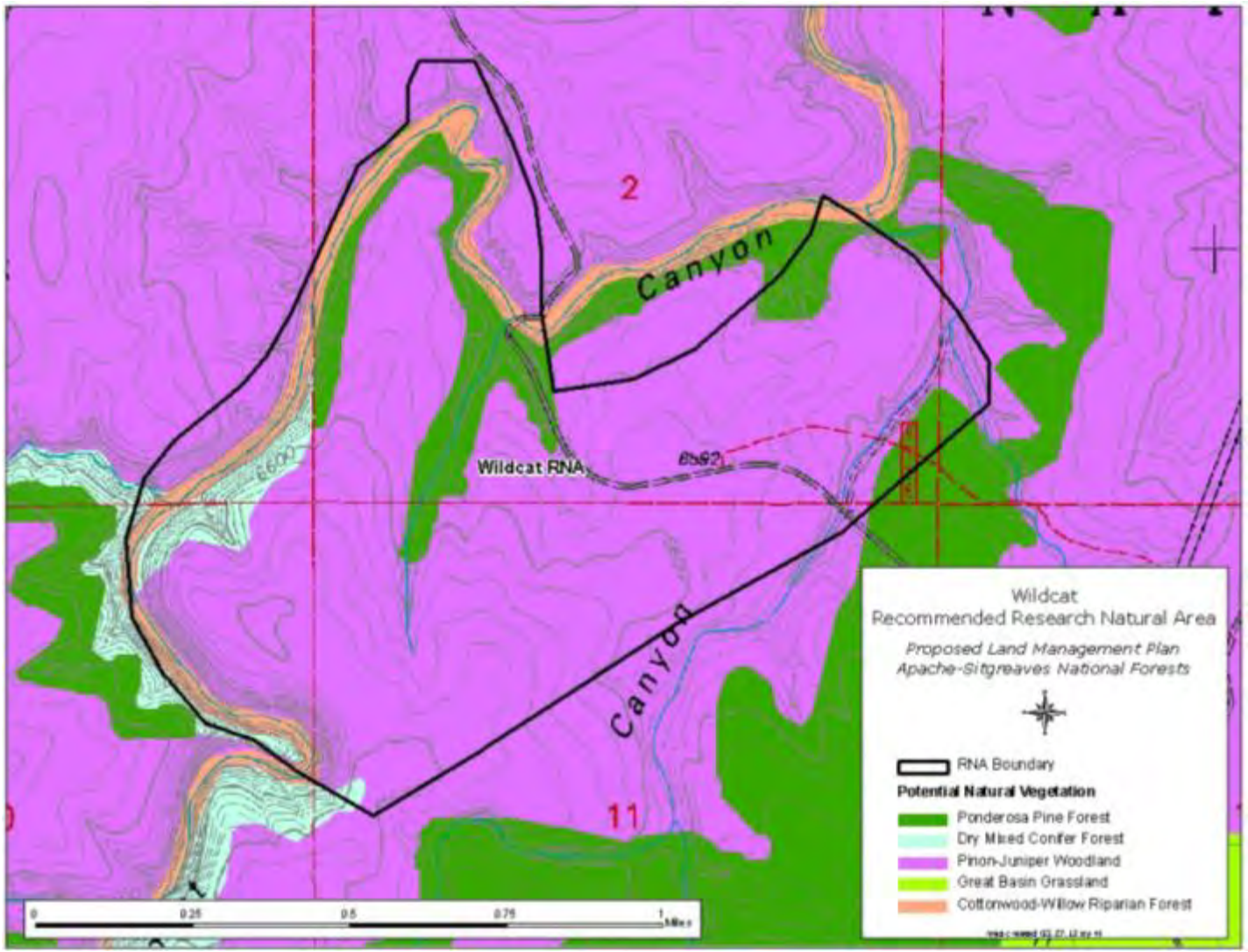

**Appendix B, Figure 2. Map of currently recommended Hayground RNA and Potential Natural Vegetation Types. It is now recommended to withdraw this area.**



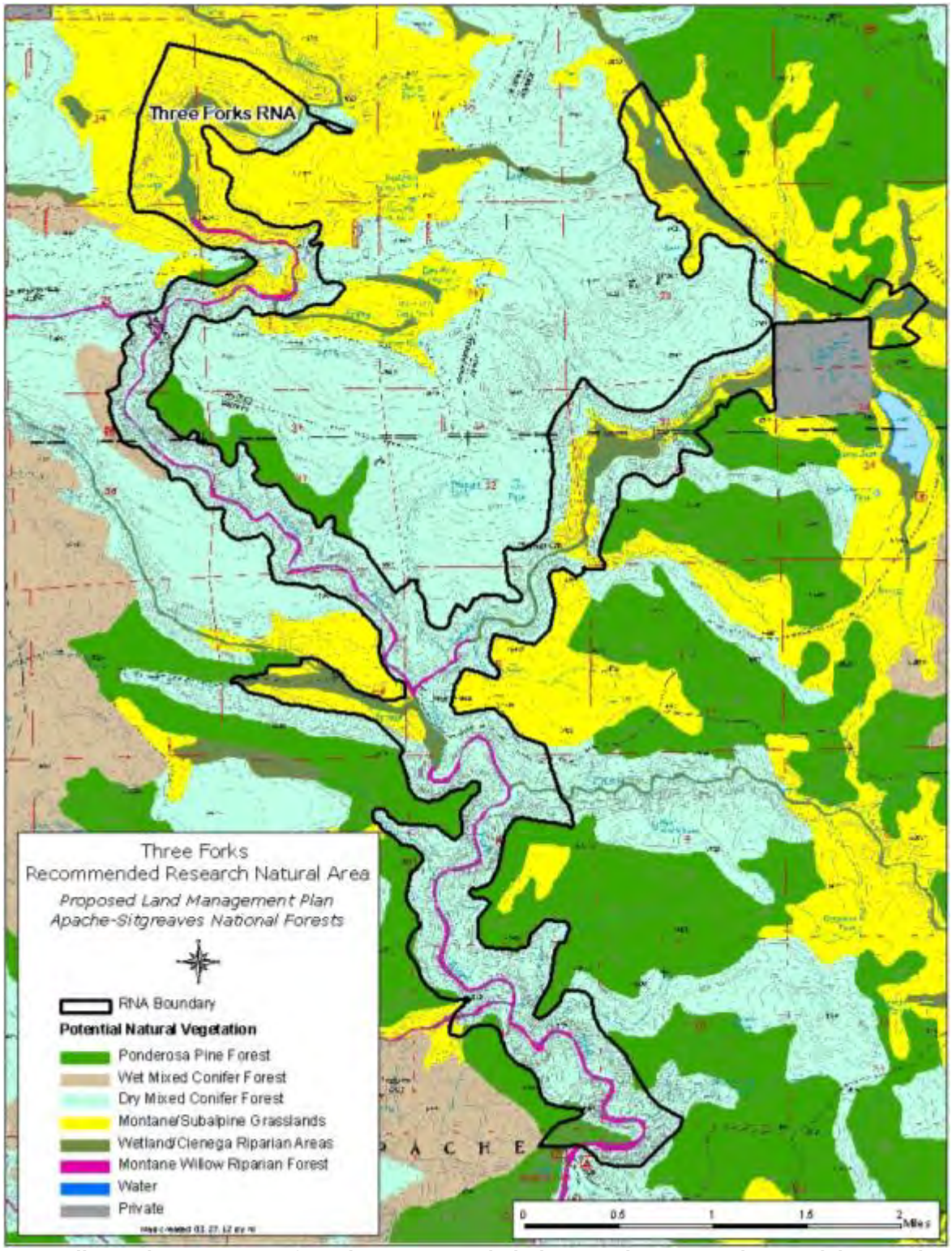

**Appendix B, Figure 3. Map of currently recommended Escudilla Mountain RNA and Potential Natural Vegetation Types. It is now recommended to withdraw this area.**



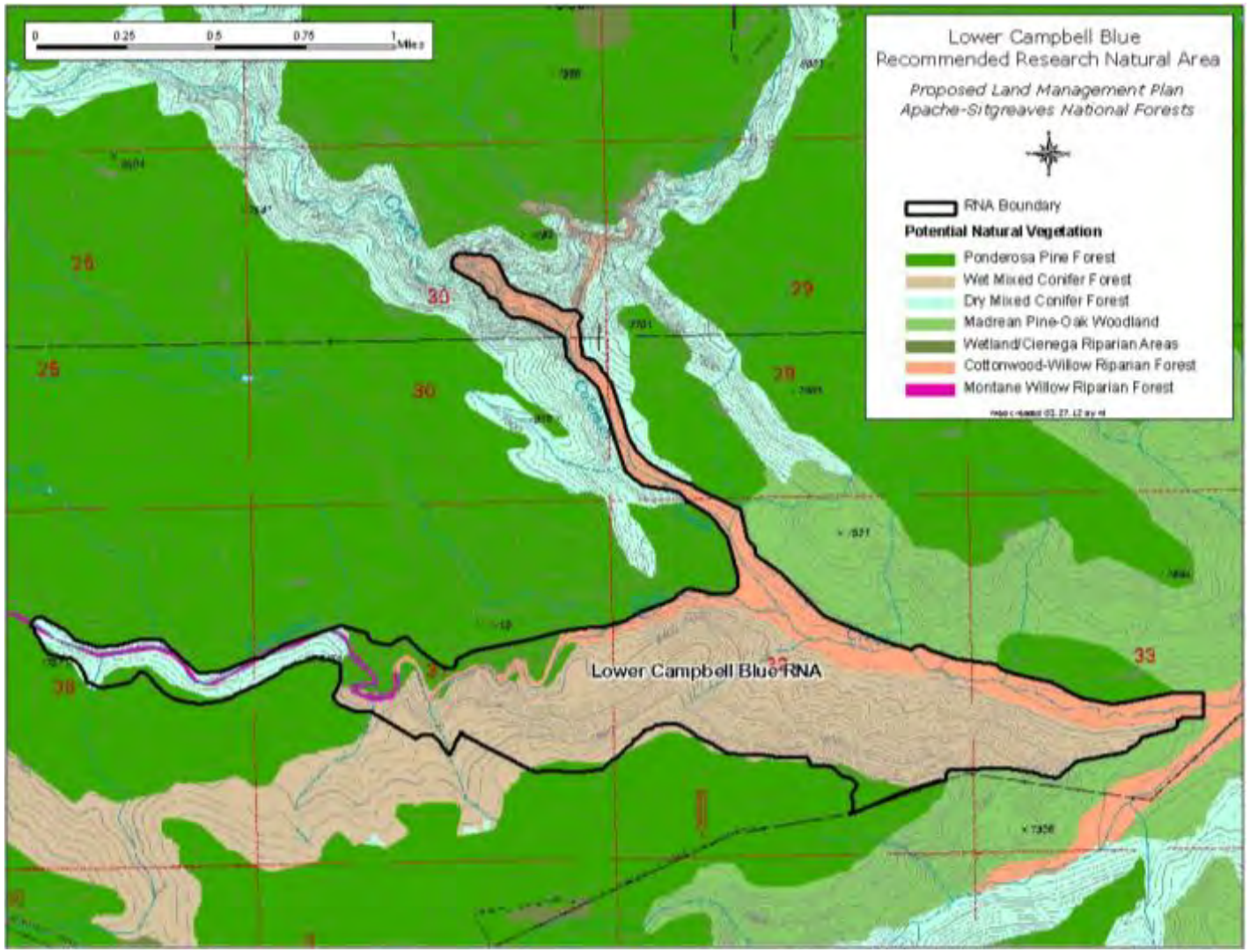

**Appendix B, Figure 4. Map of currently recommended Thomas Creek RNA and Potential Natural Vegetation Types. It is proposed to retain the recommendation.**



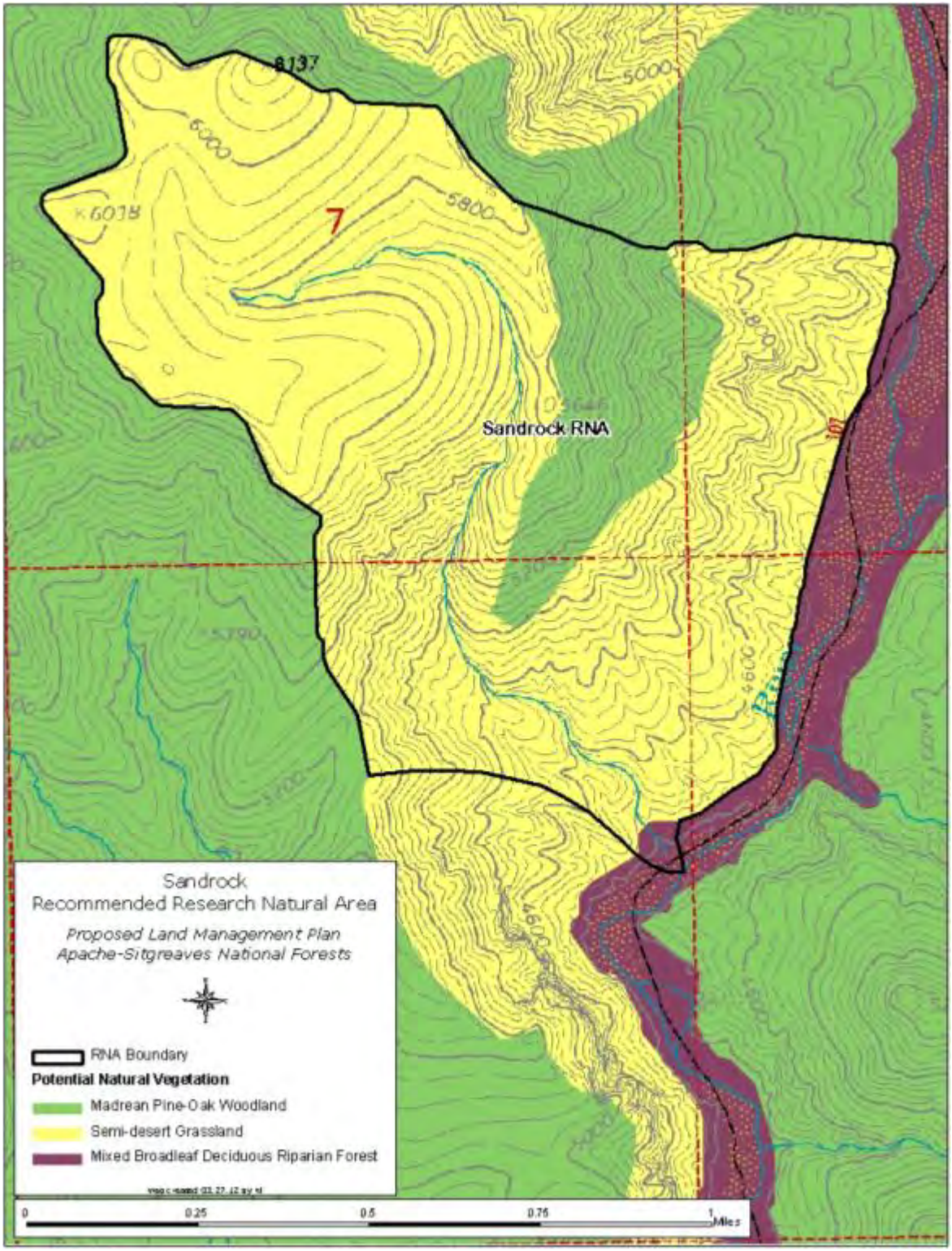

**Appendix B, Figure 5. Map of currently recommended Wildcat RNA and Potential Natural Vegetation Types. It is now recommended to withdraw this area.**



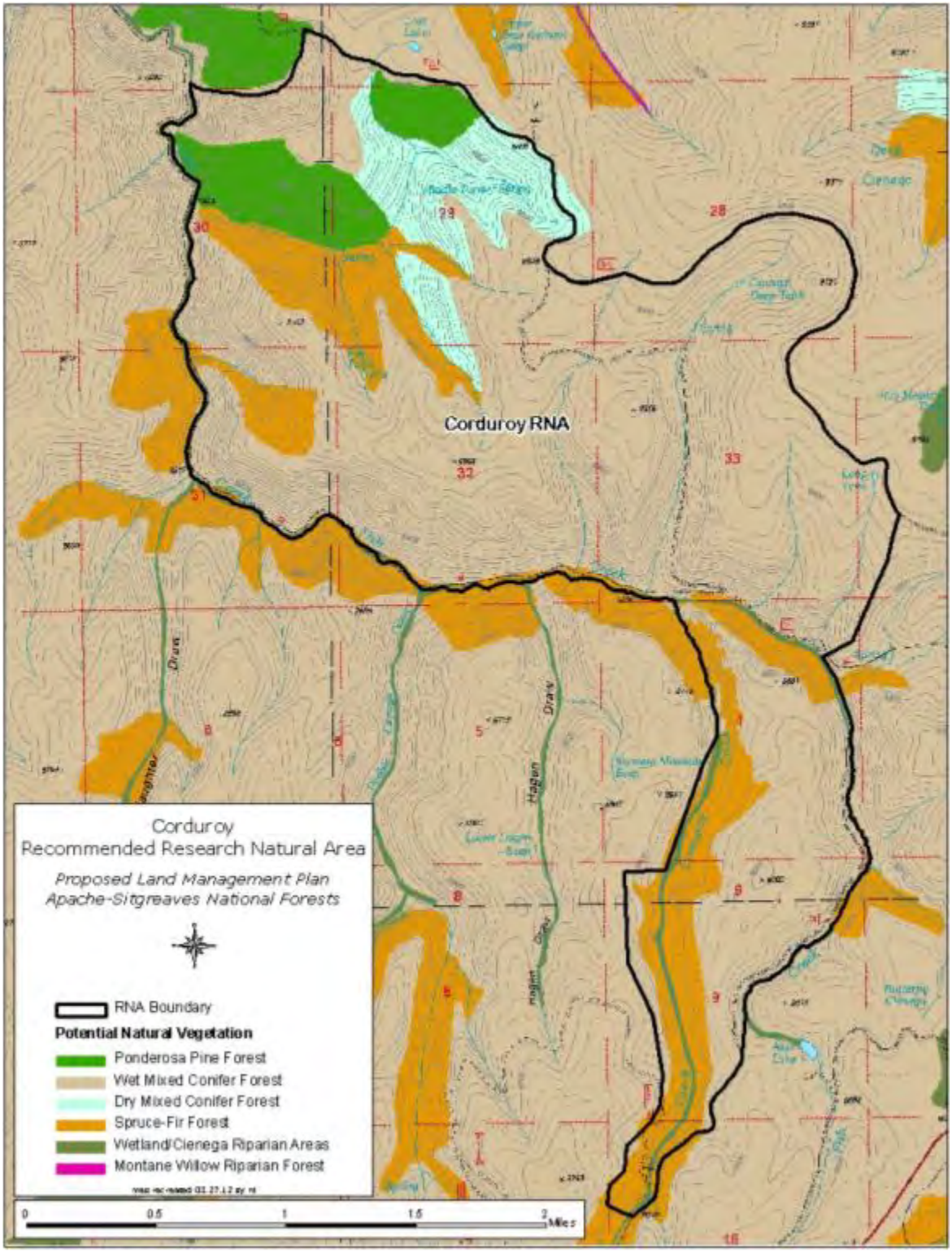

**Appendix B, Figure 6. Map of newly recommended Three Forks RNA and Potential Natural Vegetation Types.**




**Appendix B, Figure 7. Map of newly recommended Lower Campbell Blue RNA and Potential Natural Vegetation Types.**




**Appendix B, Figure 8. Map of newly recommended Sandrock RNA and Potential Natural Vegetation Types.**




**Appendix B, Figure 9. Map of newly recommended Corduroy RNA and Potential Natural Vegetation Types.**