

# Proposal to Establish Ruchi Glades Research Natural Area

## LOCATION:

The proposed Ruchi Glades Research Natural Area (Ruchi Glades PRNA) is located on the upper slopes of Oregon Caves National Monument (Figures 1 and 2) which is administered by the National Park Service (NPS). It includes Big Tree, Waterwhelp Spring, and the summit area of Mount Ruchi (el. 5354 feet). Overall, the PRNA consists of 217 acres. The site can be accessed from the north via trails which begin near the Chateau at the visitor information area. South access can be gained from land managed by the Siskiyou National Forest. Road #048 intersects an abandoned segment of the Mount Elijah Trail (#1206) leading to Mount Ruchi.

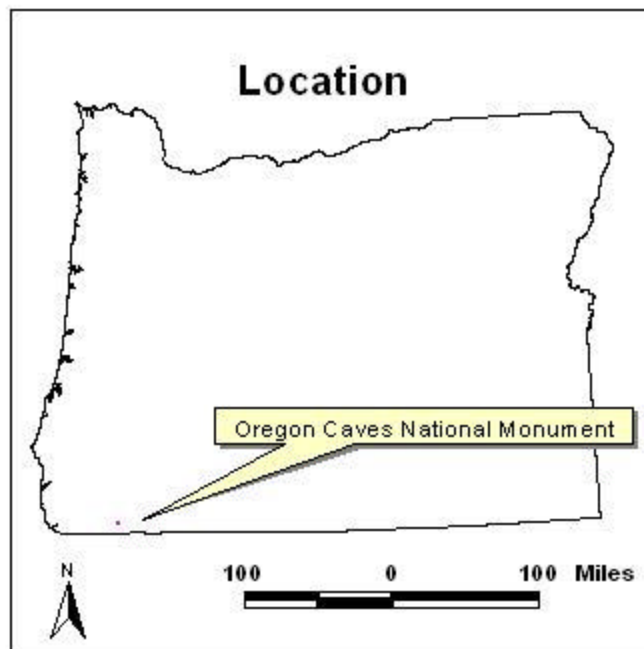


Figure 1. Location of Oregon Caves National Monument in southwest Oregon.

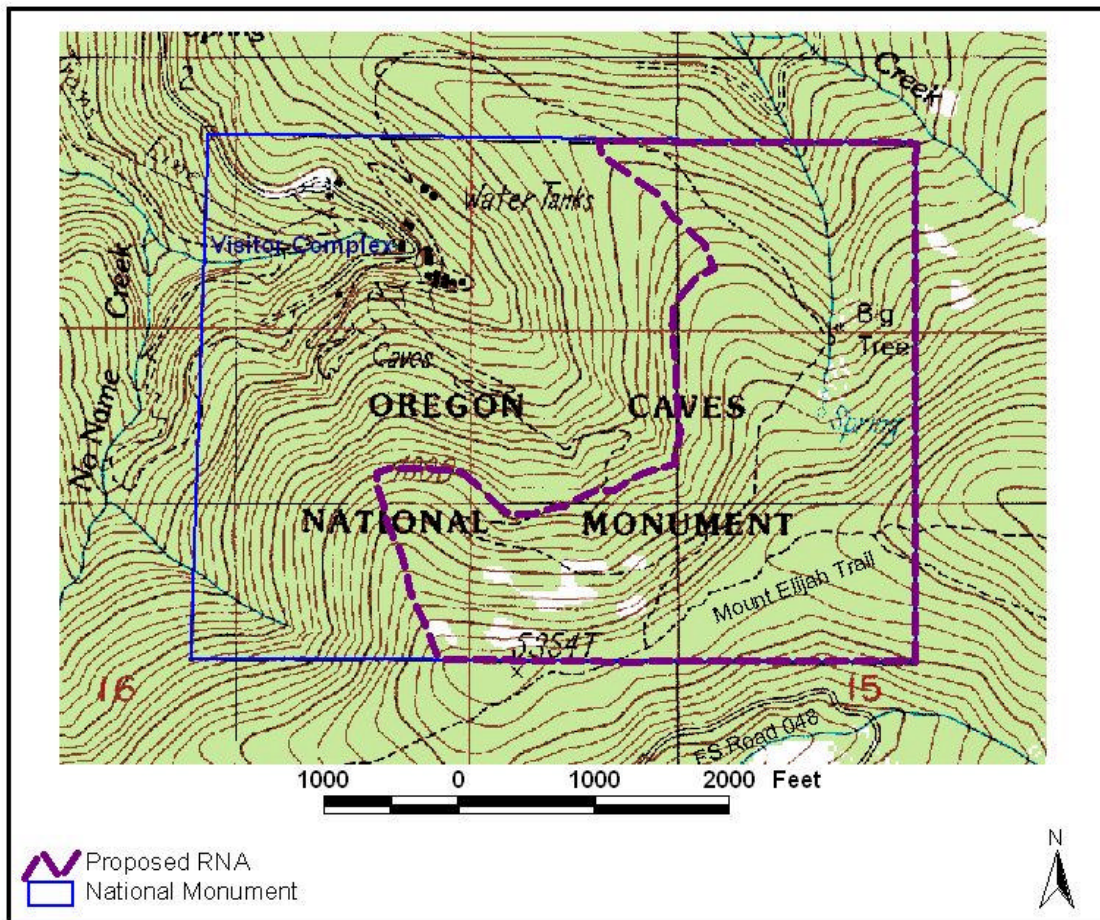


Figure 2. Location of the proposed Ruchi Glades RNA within Oregon Caves National Monument.

#### DESCRIPTION OF THE AREA:

Ruchi Glades PRNA resides on moderate upper slopes supporting a diversity of upper montane plant associations. Old-growth Douglas-fir (*Pseudotsuga menziesii*) and white fir (*Abies concolor*) shroud a majority of the PRNA. This forest features large old trees which have been spared from the logging which is so ubiquitous in the surrounding region. Included is one of the largest Douglas-fir trees in Oregon, “Big Tree.” It is reportedly 160 feet tall, over 13 feet in diameter and between 1,200 and 1,500 years old (NPS 1998). Next to Big Tree is a sitka alder riparian community extending downstream from Waterwhelp Creek Spring. A meadow complex rests on the north-facing slopes just below the summit of Mount Ruchi. These glades are a lush herbaceous mixture of tall forbs and grasses dominated by American sawwort (*Saussurea americana*) which is rare in the Klamath region. The summit of Mount Ruchi supports a serpentine shrubland dominated by greenleaf manzanita (*Arctostaphylos patula*) and dwarfed Oregon white oak (*Quercus garryana* var. *breweri*) among dryland forbs and scattered jeffrey pine (*Pinus jeffreyi*) and incense cedar (*Calocedrus decurrens*). Along the ridgetop, extending from the summit northeastward are several meadows which are primarily dominated by blue wildrye (*Elymus glaucus*).

### CLIMATE:

The nearest weather station is at Cave Junction, OR which receives a markedly different weather regime. The NPS (1998) describes the Monument as receiving mild and wet winters. Annual precipitation averages forty-five inches with snow accumulating to about seven feet at the Chateau. Winter temperatures usually range between 20° and 50° Fahrenheit while summer temperatures range between 40° and 90° Fahrenheit. Prevailing winds are from the west. Unstable weather patterns often bring strong winds from the south.

### SOILS and GEOLOGY:

A majority of the PRNA's extent is underlain by moderately deep well-drained gravelly loams of the Althouse and Jayar series (Figure 3). These soils are colluvium derived from altered sedimentary and metavolcanic parent materials (Figure 4). The Woodseye-Rock outcrop complex occurs on upper slopes and consists primarily of similar gravelly loams punctuated by rock outcrops. These soils tend to be shallow and well-drained. The very limited Crannier-Rock outcrop complex is primarily a stony sandy loam within the PRNA. Parent material consisting of ultramafic rock (serpentine) is conspicuously perched on the summit area and upper north slope of Mount Ruchi. No rigorous sampling of soils or geologic properties has occurred within the PRNA.

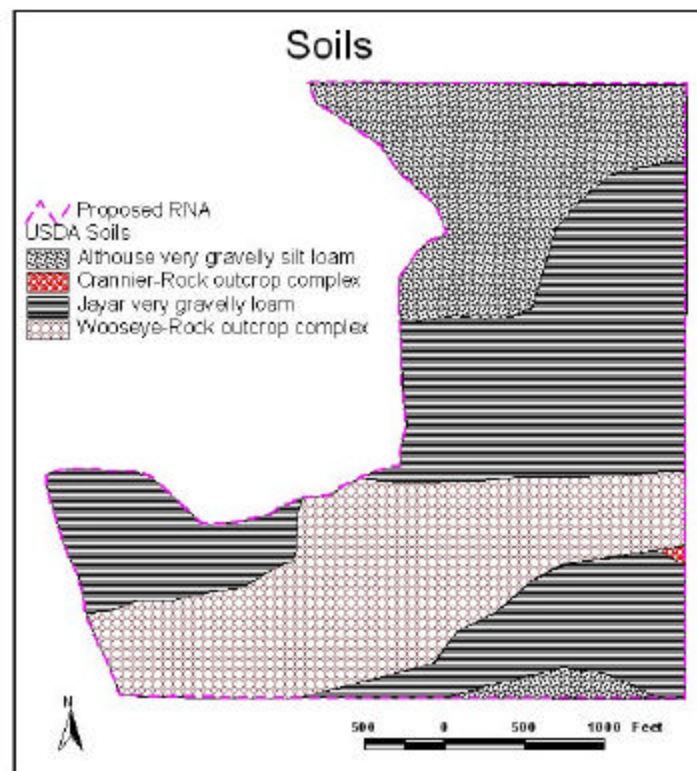


Figure 3. Soils of the proposed Ruchi Glades RNA (adapted from USDA 1983)

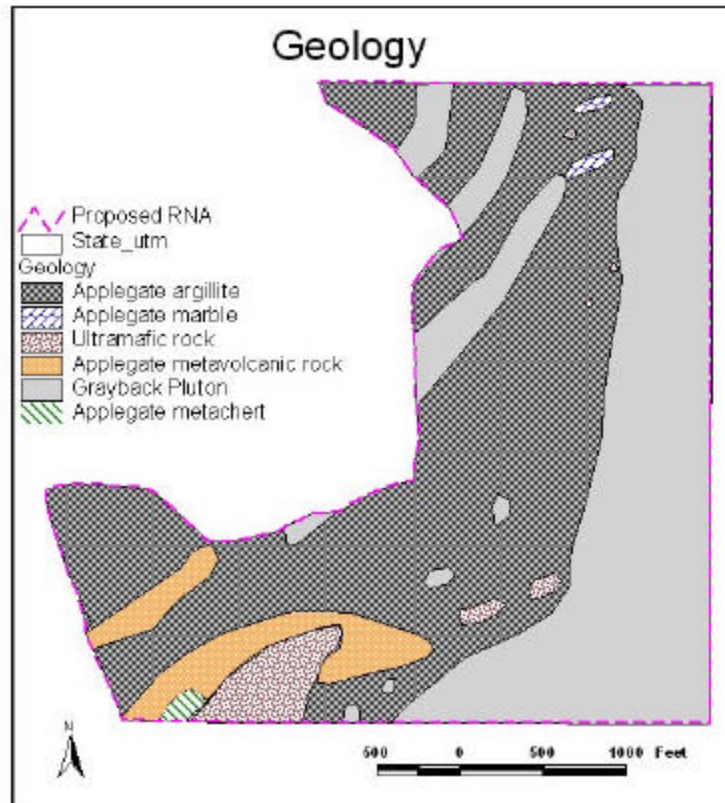


Figure 4. Geology of the proposed Ruchi Glades RNA (adapted from NPS 1998).

#### WATER:

Surface water in the PRNA is limited to several small streams. The most significant, Waterwhelp Creek, emanates several hundred feet above Big Tree. This first-order stream runs year-round but yields very little volume, supplying a small trickle most of the summer. It joins Panther Creek north of the Monument boundary. Two ephemeral streams emanate from the vicinity of the meadow complex where spring meltoff provides a source.

#### FAUNA:

The sawwort meadow complex supports mountain beaver (*Aplodontia rufa*) which is one of the most primitive rodents on Earth. It's kidneys are inefficient in retaining water, and perhaps as a result, the beaver seeks a variety of succulent plants thriving in these meadows. The old-growth forests support rare wildlife including spotted owls (*Strix occidentalis caurina*), marten (*Martes americana*), northern flying squirrels (*Glaucomys sabrinus*), red tree voles (*Arborimus (=Phenacomys) longicaudus*), hermit warblers (*Dendroica occidentalis*), Vaux's swifts (*Chaetura vauxi*), western toads (*Bufo boreas*), and Del Norte (*Plethodon elongatus*) plus clouded (*Aneides ferreus*) salamanders. The latter is a State listed species that is so rare that it is considered threatened with extirpation from Oregon. Two frogs, the Oregon spotted (*Rana pretiosa*) (a federal candidate for endangered species status) and tailed frogs (*Ascaphus truei*) are suspected of occurring in the PRNA.



## VEGETATION:

The PRNA has an impressive diversity of plant communities for such a small area. The following community names are not based on a rigorous classification effort, but are intended to provide an accurate description of the dominant flora found throughout the PRNA during a field visit performed by the Oregon Natural Heritage Program during the summer of 2000.

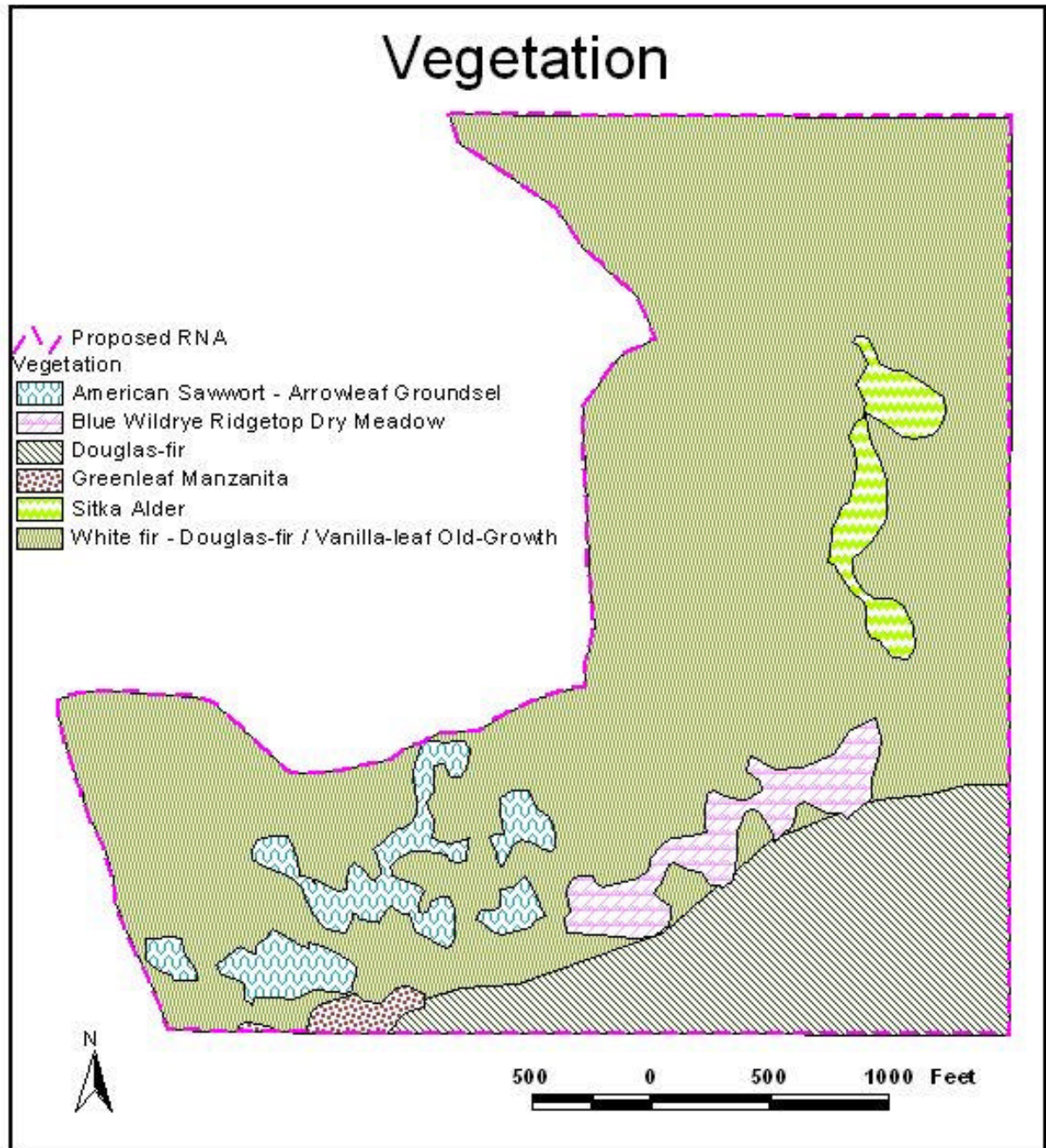


Figure 5. Vegetation of the proposed Ruchi Glades RNA.

Table 1. Extent of vegetation types within the Ruchi Glades proposed RNA.

Plant Community	Area (acres)
White Fir / Rocky Mountain Maple / Vanillaleaf Old-Growth Forest And Douglas-fir – White Fir / Vanillaleaf Old-Growth Forest	158.6
Douglas-fir	34.8
Sitka alder	4.9
American Sawwort – Arrow-leaved Groundsel Lush Meadow	9.9
Blue Wildrye Ridgetop Dry Meadow	7.2
Greenleaf Manzanita Ridgetop Shrubland	1.5
TOTAL	216.9

#### **White Fir / Rocky Mountain Maple / Vanillaleaf Old-Growth Forest**

*Abies concolor* / *Acer glabrum* / *Achyls triphylla*

This old-growth association is typified by large white fir towering above a mostly open shrub layer with a carpet of vanillaleaf. Rocky Mountain maple is very patchy in occurrence. Other abundant shrubs include oceanspray (*Holodiscus discolor*) and baldhip rose (*Rosa gymnocarpa*). The forbs, starry false Solomon's seal (*Smilacina stellata*) and red baneberry (*Actaea rubra*) support a rich forest floor layer at some sites. Occasional Douglas-fir occur in the overstory. The rare plant (State Listed Rank 3), grimmia dry rock moss (*Grimmia anomala*), thrives in partial openings. This plant community is primarily found on north to west facing upper slopes. It is similar to a community classified by Atzet and others (1996) which they called "Port Orford cedar - white fir - Douglas-fir / (dwarf Oregongrape) / vanillaleaf." It also resembles Atzet and McCrimmon's (1990) "white fir / Rocky Mountain maple" type. Agee and others (1990) describe this same community as "white fir / herb."

#### **Douglas-fir – White Fir / Vanillaleaf Old-Growth Forest**

*Abies concolor* / *Achyls triphylla*

This community is also an old-growth forest. Although Douglas-fir and white fir share dominance in the overstory, the latter is much more abundant in the subcanopy. Occasional mature Port Orford-cedar (*Chamaecyparis lawsoniana*) and sugar pine (*Pinus lambertiana*) are present. Shrubs such as baldhip rose and hazelnut (*Corylus cornuta*) are generally sparse. The herbaceous layer is dominated by vanillaleaf with lesser cover of dwarf Oregongrape (*Mahonia nervosa* var. *nervosa*), leafy pea (*Lathyrus polyphyllus*), starry false Solomon's seal, and starflower (*Trientalis latifolia*). The rare (State Listed Rank 2) bryum moss (*Bryum calobryoides*) has been found within the

PRNA. This community is found on a north and east aspect within the PRNA. It is similar to the community described by Atzet and others (1996) above, as well as the “white fir - Douglas fir / Dwarf Oregongrape” type (Atzet and Wheeler 1984). Agee and others (1990) document this community as two separate ones: “mesic white fir / Douglas-fir” and “dry white fir / Douglas-fir.”

**Douglas-fir**

*Pseudotsuga menziesii*

The ridgetop which extends east from Mount Ruchi, along with its south-facing slopes support this forest which is almost purely Douglas-fir. Tree cover is dense and tree size is rather uniform. This forest generally lacks old-growth characteristics such as canopy gaps, multi-storied tree structure with very old individuals, snags and large downed woody debris. Very little sunlight reaches the forest floor and as a result it is almost totally void of plant life but instead exhibits a thick layer of litter. The forested ridgetop is slightly different and exists as a transition to the old-growth described above. Here is found several large old Douglas-fir and at least one sugar pine greater than 4 feet diameter. White fir saplings rise from the forest floor. Also present is scattered vanillaleaf and starry false Solomon's seal. The general pure, even-aged structure of this stand suggests it has been logged in the past.

**Sitka alder**

*Alnus viridis ssp. sinuata*

This plant community is restricted to Waterwhelp Spring's small stream. It is densely populated with sitka alder which thrive in the wet soil. Understory flora include redtop (*Agrostis alba*), vanillaleaf, starry false Solomon's seal, and Pacific bleedingheart (*Dicentra formosa*). Agee and others (1990) classify this community as “sitka alder” and surmise that its origin is from the 1964 rain deluge which resulted in heavy runoff and scouring of the streambed. Sitka alder is a very abundant community throughout the Northwest reaching to Alaska.

**American Sawwort – Arrow-leaved Groundsel Lush Meadow**

*Saussurea americana* – *Senecio triangularis*

This montane meadow association is found on the upper north-facing slope just below the ridgetop extending east from Mount Ruchi. It is a collection of lush forbs thriving on well developed moist soil – some of which reach six feet in height. The total plant cover is nearly 100%, with very little exposed ground except for burrowing disturbance by resident mountain beaver. A mosaic of tree patches thrives among the meadows. American sawwort and arrow-leaved groundsel dominate. Other important plants are blue wildrye, poke knotweed (*Polygonum phytolaccifolium*), cow parsnip (*Heracleum lanatum*), California cornlily (*Veratrum californicum* var. *californicum*), and horse-mint (*Agastache urticifolia*). This community is similar to other montane-subalpine lush herbaceous meadows in the Northwest which are dominated by high cover values of large succulents such as poke knotweed, cornlily, groundsel, and Sitka valerian

(*Valeriana sitchensis*) (Douglas 1972, Hickman 1976, Murray 1992). However, it is uniquely distinguished in the Klamath-Siskiyou Region by the co-dominance of sawwort. Although this general community is found in the Olympic Mountains (Kuramoto and Bliss 1970), sawwort is uncommon in the Klamaths and is also at the southern extreme of its range.

#### **Greenleaf Manzanita Ridgetop Shrubland**

*Arctostaphylos patula*

Primarily a shrubland with scattered trees, this community is restricted to the summit area of Mount Ruchi. The bouldery ridgeline and well-drained underlying shallow serpentine soils limit plant cover and productivity. Because this shrubland is very heterogeneous and limited in extent, it does not lend itself to classification well. Greenleaf manzanita is the most abundant species but plant distribution is very patchy, with dwarf oaks and bitter cherry (*Prunus emarginata*) also forming small monospecific stands. On the south edge of the ridgetop are dense patches of incense cedar. Jeffrey pine, Douglas-fir, and incense cedar sparsely populate this shrubland. Also found are dryland forbs including buckwheat (*Eriogonum* spp.), hawksbeard (*Crepis* sp.), rabbitbrush (*Chrysothamnus nauseosus*), and rockcress (*Arabis* sp.). Bearing very little uniformity, a comparison of this assemblage to other published works is of little merit. However, serpentine substrate as well as several plant species are found nowhere else on the National Monument.

#### **Blue Wildrye Ridgetop Dry Meadow**

*Elymus glaucus*

Mount Ruchi's summit is a terminal extension of a northeast/southwest trending ridge which supports herbaceous meadows characterized by abundant blue wildrye. These meadows reside on an area known locally as "Sandy Flats," named for the coarse soils derived from quartz diorite. Relatively shallow and stony soils have moderately low water-holding ability. The Sandy Flats meadows are generally convex, unlike the sawwort – groundsel meadows which are mostly concave. The height of vegetation is less than three feet and plant cover is less than 75%. In addition to blue wildrye, also occurring are common yarrow (*Achillea millefolium*), mountain monardella (*Monardella odoratissima*), and paintbrush (*Castilleja* sp.). Scattered throughout the meadows are bitter cherry shrubs. Dwarf oaks are common along the forest margins. Documentation of this community type elsewhere in the Pacific Northwest is not readily apparent.

#### CULTURAL RESOURCES:

Knowledge of cultural resources in the PRNA is very limited. An arrowhead made of local chert was found on Mount Ruchi. According to a local expert and Native American, John Oakhurst, a meeting place for regional tribes was situated near the northern boundary of the National Monument and PRNA where the Big Tree trail occurs. The NPS has no physical evidence documenting this, however.

#### LAND USE:

The PRNA has been managed as a National Monument since 1909. Since then, it has been a fundamental goal of the NPS to preserve natural conditions including plant



and animal species composition. The current objective for fire management is to allow lightning-ignited fire where it does not threaten human developments. These prescripts are all compatible with RNA designation.

#### JUSTIFICATION:

The NPS Natural Resources Management Guideline (NPS-77) addresses Research Natural Areas in Chapter 4, pages 13-17, under special park designations and selection, designation and management procedures.

The Oregon Natural Heritage Plan (Oregon Natural Heritage Advisory Council 1998) identifies natural area needs within Oregon's ecoregions based on natural vegetation types. The Ruchi Glades PRNA supports two vegetation needs for the Klamath ecoregion:

#19 Douglas-fir – white fir forest at high elevation

#76 Sawwort - arrow-leaved groundsel lush meadow  
(originally defined as: #76 Wetland on calcareous substrates with willow and sawwort)

#### MANAGEMENT RECOMMENDATIONS:

Current management of the Monument is directed towards protecting natural features while providing services for visitor needs. The National Park Service outlines six fundamental goals for managing the Monument (NPS 1998):

- Natural and cultural resources will be protected.
- Scientific baseline data used in management decisions will be maintained and increased.
- Visitors will be satisfied in safely experiencing the Monuments features.
- Visitors will understand and appreciate preservation of the Monument's resources.
- Cooperative agreements and partnerships will help conserve the Monument.
- Appropriate management practices, systems, and technologies are used.

These goals are conducive with the management of a Research Natural Area (RNA) within the Monument. Therefore, major changes in management are not necessary with RNA designation. However, visitor use within the PRNA and management of adjacent land will influence the conditions of the PRNA. Therefore, several recommendations are provided in order to maintain a high degree of ecological integrity which is necessary for an RNA.

Visitor impacts are primarily associated with trail hiking within the PRNA. Hikers are disturbing the vegetation and soil surrounding the base of Big Tree where bare soil and roots have been exposed. This threatens the tree's vigor. It is suggested that an unobtrusive fence or similar barrier be placed around the tree and the trail be relocated at least 50 feet away. As an alternative, an elevated viewing platform may be built closer to the tree. While it is important to protect the tree from human-caused impacts, preserving the tree by protecting it from natural ecosystem processes such as fire and native disease is not warranted. The purpose of an RNA is to facilitate ecosystem processes with little or no human interference and to study them and their effects.

Hikers can easily introduce spores of a fungus (*Phytophthora lateralis*) which causes Port Orford-cedar root disease in the region. A potential mode for infection is mud being translocated on someone's footwear from an infected area to the Monument which is not infected. The highest risk for introduction is at stream crossings which can wash the mud-encased spores off and transport them downstream infecting soil along the stream banks. Once spores infect tree roots, the disease is usually fatal. Waterwhelp Creek is at high risk of receiving and spreading the spore to creekside Port Orford-cedar. It is strongly suggested that hikers do not walk through the stream bed as currently occurs on a daily basis during the summer. The NPS should consider relocating the trail to the west side of Waterwhelp Creek. Building bridges or restricting crossings to when the creek is dry would also lower the risk of introduction, but not as well because mud could still be deposited in the streambed.

Along with hikers, horse traffic presents a significant risk of introducing exotic plant species. Blue wildrye ridgetop meadows are especially prone to invasion due to their open sunny location and considerable bare soil. The Limestone and Mount Elijah Trails should be closed to horse use within the RNA to help prevent introductions.

Fires were historically a dominating force responsible for the ecological integrity of the Monument (Agee and others 1990) but have been suppressed for almost a century. It is recommended that fire be re-introduced to the PRNA. Preferably, lightning-ignited fires will be allowed, however these would most likely occur during late summer and transfer from lower elevations. This scenario is unlikely to be permitted due to risks. Managers may consider prescribed fires but should strive to mimic the properties of the indigenous fire regime, especially intensity and seasonality. However, much caution should be taken in deciding how to re-introduce fire. As a result of historic fire exclusion, stand conditions may no longer support the typical low-moderate severity fires of the past. Before applying fire, it is suggested that fuel evaluations be made in order to model fire effects. If high severity fires are predicted, then managers should consider preparing/restoring the PRNA or igniting fires during early summer or autumn.

A final recommendation concerns the context of the RNA in its larger landscape. The RNA itself is very small and its integrity will be determined in large part, by management on its borders, all of which is forested (Figure 6). These forests should be manipulated as little as possible. Severe logging prescriptions which have removed most of the overstory has occurred recently (1998) within a half-mile of the PRNA on land managed by the Siskiyou National Forest. A separate harvest completed in 1997 directly borders the northeast corner of the PRNA. Logging impacts are not restricted to the harvested sites, but permeate into surrounding forest in the form of wind damage, lower humidity, increased fire hazard, and plant species changes. An additional concern is interference with wildlife movement patterns to and from the PRNA.

To ensure that the RNA remains a baseline of scientific merit, the NPS and Siskiyou NF should develop a formal agreement which ensures that local timber management doesn't impact the RNA. Although the vast majority of adjacent land is either designated Late Successional Reserve (LSR), Botanical Area (Bigelow Lakes), or Parkland limited forest cutting can still occur under certain conditions. Moreover, the longevity for LSR protections is uncertain. In addition to timber, fire and recreation must also be considered in a mutual understanding between agencies as a critical component of this RNA's success.

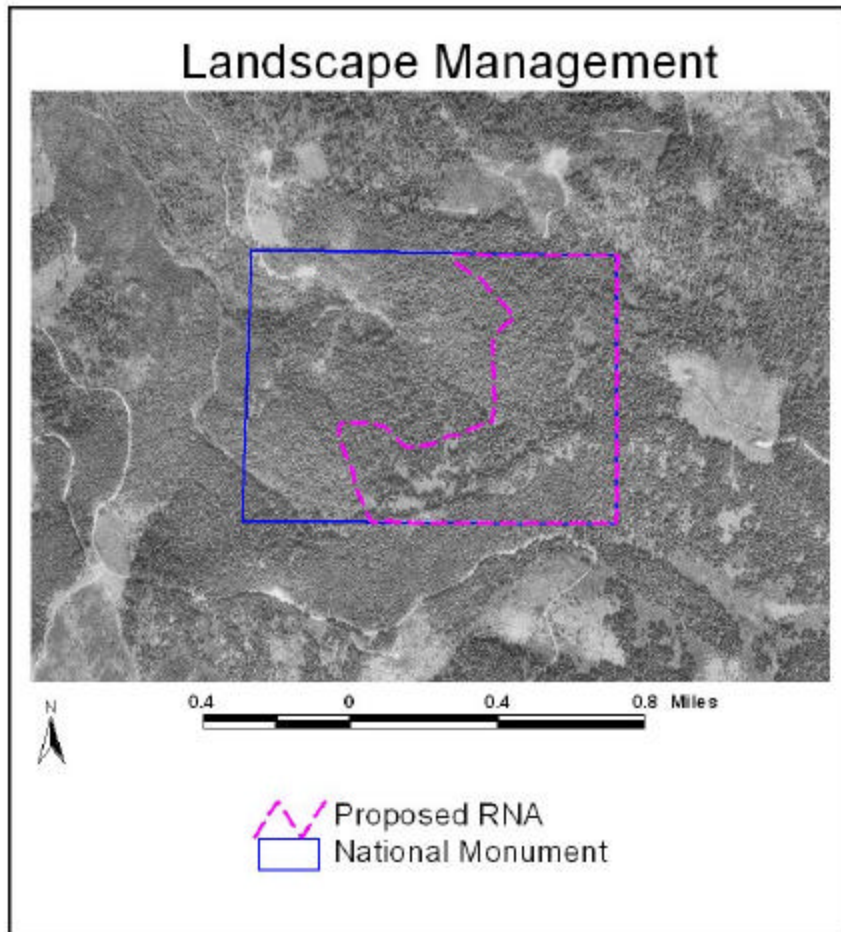


Figure 6. The proposed Ruchi Glades RNA is bordered by the Siskiyou National Forest.

Management Summary:

- Protect Big Tree from impacts around its base
- Reduce risk of Port Orford-cedar root disease
- Prohibit horse use on Mount Elijah and Limestone Trails
- Monitor and control exotic species
- Re-introduce fire to mimic native fire regime
- Develop a formal interagency agreement on management

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