DECISION NOTICE/DESIGNATION ORDER
Finding of No Significant Impact

Shaketable Research Natural Area
(Forest Plan Amendment #64)

USDA Forest Service
Malheur National Forest
Blue Mountain Ranger District
Grant County, Oregon

An environmental assessment (EA) that discusses the Shaketable Research Natural Area (RNA) on the Blue Mountain Ranger District is available for public review at the Forest Supervisor's Office, Malheur National Forest in John Day, Oregon.

DECISION

I am deciding to select the proposed action as described in the 2005 *Shaketable Research Natural Area Environmental Assessment* (EA). Specifically, I am deciding to designate 385 acres located 15 miles (23 km) southeast of Dayville, Oregon (Figure 1) as the Shaketable RNA. -The legal location of this tract covers Section 13 of T.15 S., R. 27 E., and Sections 17, 18, 19 and 20 of T.15 S., R. 28 E., in Grant County.

This decision is a non-significant amendment to the Malheur National Forest Land and Resource Management Plan (Forest Plan) and the RNA will be managed in compliance with all relevant laws, regulations and Forest Service Manual direction regarding Research Natural Areas.

RATIONALE

My decision to establish the Shaketable RNA responds to the need to preserve an example of a significant natural ecosystem, preserve gene pools for this community type, and provide an educational and research area for study of these ecosystems. This designation formally recognizes that the site is representative of western juniper/low sagebrush/bunchgrass, low sagebrush/Idaho fescue, rigid sagebrush/Sandberg's bluegrass, and bitterbrush/bunchgrass woodland identified by the Oregon Natural Heritage Advisory Council (Oregon Natural Heritage Advisory Council 2003). This site, currently tracked as a proposed RNA in Management Area (MA) 9, would be tracked as part of the MA-9 permanent RNA network.

PUBLIC INVOLVEMENT

Public comments on the proposal were invited with a scoping letter to interested parties on May 25, 2005. On October 5, 2005 a legal notice was published in the Blue Mountain Eagle notifying the public that the EA was available for review and comment. One comment was received and is available upon request from the Malheur National Forest.

ALTERNATIVES CONSIDERED

Two alternatives, the Proposed Action and No Action, were considered. Under the No Action Alternative, the candidate area would continue to be managed as a proposed RNA as directed in the Forest Plan. Management Direction would continue until the Forest Plan is revised or replaced. The Proposed Action would designate in perpetuity 385 acres on the Blue Mountain Ranger District.

FINDINGS REQUIRED BY OTHER LAWS

After consideration of environmental consequences I have determined that the Proposed Action is consistent with other laws and regulations.

Consistency with Forest Plan Direction

The Proposed Action is consistent with the Malheur National Forest Land and Resource Management Plan Final Environmental Impact Statement, Record of Decision and the accompanying Land and Resource Management Plan, as amended (USDA Forest Service 1990), dated May 25, 1990.

Forest Plan Amendment #64 and Determination that the Forest Plan Amendment is Not Significant under NFMA

I have determined that Forest Plan Amendment #64 is not a significant amendment under the National Forest Management Act implementing regulations [36 CFR 219.10(f)] (1982) and is consistent with the planning rule adopted in November 2000 at 36 CFR 219 and subsequently interpreted in an Interpretative Rule at 69 Fed. Reg. 58055 (September 29, 2004). The Forest Service Land and Resource Management Planning Manual (Forest Service Manual 1926.51) lists the changes to the land management plan that are not significant can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management. (Forest Plan Level);

2. Adjustments of management area boundaries or management prescriptions resulting from further on-site analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management (MA area);

3. Minor changes in standards and guidelines;

4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

Amendment determination of significance:

1. When the Forest Plan was approved in 1990, there was one existing research natural area (RNA) - Canyon Creek (approximately 750 acres) and four proposed RNAs within Management Area (MA) 9. Since approval of the Forest Plan, the designation of Dugout Creek RNA in 2006 is the only RNA out of the four proposed that has been designated. Designation of Dugout Creek RNA increased the total amount of

RNA acres within MA-9 to approximately 1,658 acres. Areas proposed as RNAs in MA-9 were treated similar to designated RNAs under the description, goals and general management standards for the management area. In this respect, the proposed RNAs were anticipated by the Forest Plan to be designated at some future time. The designation of Shaketable as a RNA will not alter the multiple use goals and objectives of the Forest Plan. The Forest Plan identified the area proposed as Shaketable RNA as an important addition to the RNA network, however; the amendment does not effect the establishment of any other proposed RNA.

2. Due to specific on-site analysis, the management area boundaries for the Shaketable RNA (MA-9) would be increased from the 1990 Forest Plan proposal of 375 acres to 385 acres. This change would allow an example of western juniper/low sagebrush/bunchgrass, low sagebrush/Idaho fescue, rigid sagebrush/Sandberg's bluegrass, and bitterbrush/bunchgrass woodland to serve as a benchmark for comparison with areas of similar vegetation that are intensively used. The amendment will increase the RNA network by 385 acres. Shaketable RNA is currently embedded within MA-10 Shaketable Semiprimitive Nonmotorized (SPNM) area, which is also part of the Shaketable Inventoried Roadless Area as mapped under the Roadless Area Conservation Rule (USFS, 2001a). Shaketable SPNM is approximately 8,997 acres and managing an additional 385 acres as MA-9 would only affect 4% of the Shaketable SPNM area.

3. Although the amendment will officially designate the Shaketable RNA, the management prescription for the area would not change from current management. The amendment does not change the goals and objectives for other resources in the Forest Plan. Since the area has been managed under MA 9 since 1990, there would be no expectation of a change in timber, wildland fire or range management. Therefore, anticipated changes brought about by this amendment in the levels of resource activities and outputs projected for this planning period are not expected to be measurable.

4. The amendment is intended to facilitate achievement of management prescriptions for a continuous research natural area (RNA) network. Region 6 developed a network of RNAs designated to "illustrate adequately or typify for research or education purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance." This amendment provides for the designation of a RNA for perpetuity.

Summary: Amendment determination of significance:

The Malheur Forest Plan was approved in 1990 and is currently in the process of being revised. Amendment #64 will result in permanent designation of the Shaketable RNA, would remain in effect in perpetuity and would be included in any revised Forest Plans as a designated RNA.

The planning area for the Malheur National Forest is about 1.5 million acres (Forest Plan, p. I-2). Under the Forest Management Plan, Research Natural Areas fall into

Management Area (MA) 9 and this RNA would increase the total acreage in the MA network by 385 acres of formally established RNA acres. Designation of Shaketable RNA would affect less than 1% of the total Malheur National Forest acres.

On the basis of information and analysis contained the EA, and all other information available, it is my determination that adoption of the management direction reflected in my decision does not result in a significant amendment to the Forest Plan.

FINDING OF NO SIGNIFICANT IMPACT

Based on the analysis in the EA (which incorporates by reference the discussion on environmental effects), I find that the establishment of the Shaketable RNA is not a major Federal action that would significantly affect the quality of the human environment, therefore an environmental impact statement is not needed. My rationale for this finding is as follows (40 CFR 1508.27):

Context

Although this decision is an addition to the national system of RNAs, both long-term and short-term physical and biological effects are limited to the local area. This decision preserves and protects intact ecosystems , as discussed in the Shaketable Research Natural Area Environmental Assessment (EA).

Intensity

1) There are no effects on public health or safety because this is decision preserves intact ecosystems and does not have consequences to human well-being.
2) There are no significant direct, indirect, or cumulative impacts to the natural resources or other components of the human environment from designation of land as an RNA.
3) Effects on the human environment are not uncertain, do not involve unique or unknown risks, and are not likely to be highly controversial from designation of land as an RNA.
4) There are no known effects on historical or cultural resources, park lands, prime farm land, wild and scenic rivers or wetlands and floodplains. There are no known historical resources, park lands, prime farm lands, or wild and scenic rivers affected by this decision). The effect of establishing the RNA is to protect ecologically sensitive areas and therefore only beneficial effects are anticipated to any environmentally sensitive or critical area, including wetlands or floodplains.
5) The action is not likely to establish a precedent for future actions with significant effects because it is limited to a protective designation.
6) The project will not adversely affect any federally listed or proposed threatened or endangered species or their critical habitat since the designation decision does not implement any on-the-ground projects rather than potentially posting the RNA boundaries. Specifically, the determination of effects for endangered and threatened wildlife species or their habitats is No Impact. The determination of effects for sensitive species wildlife species is No Impact. There are no threatened or endangered plant species or their suspected habitat on the Malheur National Forest. Designating

the research natural area will have no impact for sensitive plant species because there would be no environmental effects. In addition there are no listed aquatic species present within the designated area. There will be no negative impact on sensitive aquatic species.

7) The proposed action is consistent with federal, state and local laws and requirements imposed for the protection of the environment.

IMPLEMENTATION

Legal Notice of this decision will appear in the Oregonian, as newspaper of record for Regional Forester Decisions in Oregon, as well as in the Blue Mountain Eagle, the newspaper of record for the Malheur National Forest. A copy of the legal notice will be mailed to all persons stating interest in the project. Implementation of this decision shall not occur within 7 calendar days following publication of the legal notice in the Oregonian.

APPEAL OPPORTUNITIES

This decision is subject to appeal under 36 CFR 217 but does not require notice and comment under 36 CFR 215. Any Notice of Appeal of this decision must be fully consistent with 36 CFR 217.9 (Content of Notice of Appeal) and must include the reasons for appeal. Written notice of appeal must be postmarked or received by the Appeal Deciding Officer, Abigail Kimbell, within 45 days of the date the legal notice appears in the Oregonian. Submit written notice of appeal to:

Chief, USDA Forest Service
ATTN: NFS Appeals
14th and Independence SW
P.O. Box 96090
Washington, D.C. 20090-6090

/s/ Liz Agpaoa _____ April 24, 2008 _____

Regional Forester Date

DESIGNATION ORDER/DECISION NOTICE

An Order establishing Shaketable Research Natural Area

By virtue of the authority vested in me by the Secretary of Agriculture under regulations 7 CFR 2.42 and 36 CFR 251.23, this is my Designation Order to establish the Shaketable Research Natural Area. The Shaketable Research Natural Area shall be comprised of lands described in the section of the Establishment Record entitled "Location".

Regional Forester John Butruille recommended the establishment of the Shaketable Research Natural Area in the Malheur National Forest Land and Resource Management Plan dated May 25, 1990 which is incorporated into this document by reference. That recommendation was the result of an analysis of the factors listed in 36 CFR 219.25 and Forest Service Manual 4063.41. The results of the Regional Forester's analysis are documented in the Final Environmental Impact Statement for the Malheur National Forest Land and Resource Management Plan. The Establishment Record for the Shaketable Research Natural Area is available to the public.

The Shaketable Research Natural Area will be managed in compliance with all relevant laws, regulations and Manual direction regarding Research Natural Areas. The Shaketable Research Natural Area will be administered in accordance with the management direction identified in the Establishment Record. The Malheur National Forest Land and Resource Management Plan is hereby amended to be consistent with the management direction identified in the Establishment Record and this Designation Order. This direction will remain in effect unless amended pursuant to 36 CFR 219.10. This is a non-significant amendment of the Malheur National Forest Land and Resource Management Plan.

Based on the Environmental Analysis documented in the Malheur National Forest Land and Resource Management Plan, the Environmental Impact Statement, and the Establishment Record, I find that designation of the Shaketable Research Natural Area is not a major Federal action significantly affecting the quality of the human environment.

The Forest Supervisor of the Malheur National Forest shall notify the public of this amendment and will mail a copy of the Designation Order and amended direction to persons on the Malheur National Forest Land and Resource Management Plan mailing list.

___/s/ Liz Agapoa_____ ____April 24, 2008____

Regional Forester Date

SIGNATURE PAGE

For

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Shaketable Research Natural Area

Malheur National Forest

Grant County, Oregon

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met and that boundaries are clearly identified in accordance with FSM 4063.21, Mapping and Recordation and FSM 4063.41 5.e(3) in arriving at this recommendation. Establishment of Shaketable RNA for the described purposes is recommended by the following:

Prepared by /s/ Dick Vander Schaaf Date 1/28/08
Dick Vander Schaaf,
The Nature Conservancy

Recommended by /s/ Robert Crisler for Date 3/28/08
Brooks Smith , District Ranger,
Blue Mountain Ranger District

Recommended by /s/ Gary L. Benes Date 3/28/08
Gary L. Benes, Forest Supervisor
Malheur National Forest

Concurrence of /s/ Bov Eav Date 4/3/08
Bov Eav, Director,
Pacific Northwest Research Station

TITLE PAGE

Establishment Record for
Shaketable Research Natural Area
within Malheur National Forest
Grant County, Oregon

ESTABLISHMENT RECORD FOR
SHAKETABLE RESEARCH NATURAL AREA
WITHIN MALHEUR NATIONAL FOREST
GRANT COUNTY, OREGON

INTRODUCTION

Shaketable Research Natural Area (RNA) is located in the Blue Mountains Physiographic Province of Oregon and borders the High Lava Plains Physiographic Province. The site represents the sagebrush steppe with a dominant natural community of low sagebrush (*Artemisia arbuscula*)[1] shrubland and Idaho fescue as the dominant grass species. Rigid sagebrush (*Artemisia rigida*) can be found in large patches within the low sagebrush community as well as a number of grass species including junegrass (*Koeleria cristata*), bluebunch wheatgrass (*Agropyron spicatum*) and one-spike oatgrass (*Danthonia unispicata*). Mountain mahogany (*Cercocarpus ledifolius*), western juniper (*Juniperus occidentalis*) and bitterbrush (*Purshia tridentata*) also occur at the site in a western juniper savanna community that occupies rimrock habitat as well as portions of the upper plateau. Ponderosa pine (*Pinus ponderosa*) occurs sporadically in the western juniper savanna. The site covers the top of a ridge system on the plateau between the South Fork and mainstem of Murderers Creek, a major tributary of the South Fork John Day River. Due to steep, rough terrain the site is somewhat excluded from most livestock grazing with no timber harvest, therefore the RNA is in excellent natural condition. This proposed RNA is located within the Shaketable Semi-Primitive Non-Motorized Area, a congressionally designated area.

Land Management Planning

Shaketable RNA was proposed as an RNA by the Malheur National Forest to meet three unfilled natural area cell needs for western juniper/low sagebrush/bunchgrass (*Juniperus occidentalis/Artemisia arbuscula*/bunchgrass), low sagebrush/Idaho fescue (*Artemisia arbuscula/Festuca idahoensis*), and bitterbrush/bunchgrass (*Purshia tridentata/*bunchgrass) (Oregon Natural Heritage Advisory Council 1993)[2]. Shaketable area was included as a proposed RNA in the FEIS for the Malheur National Forest (USDA Forest Service 1990a), in the Forest Plan (USDA Forest Service 1990b) and in the Record of Decision (USDA Forest Service 1990c).

[1] Nomenclature for vascular plants follows Hitchcock and Cronquist (1973) and Little (1979) for trees.

[2] Authors' names in parentheses refer to references cited.

The site also contains high quality representations of an additional natural community, some of which fills cell needs in the Oregon Natural Heritage Plan (Oregon Natural Heritage Advisory Council 1993). The area includes rigid sagebrush/Sandberg bluegrass (*Artemisia rigida*/*Poa sandbergii*) and was determined to fill a cell need in the 2003 revision of the Heritage Plan.

Shaketable includes the following RNA cell needs (or elements) in Blue Mountains Physiographic Province:

TERRESTRIAL ECOSYSTEMS

1. Western juniper/low sagebrush/bunchgrass community.

61. Low sagebrush/Idaho fescue community.

64. Rigid sagebrush/Sandberg's bluegrass

69. Bitterbrush/bunchgrass community.

(Oregon Natural Heritage Advisory Council 2003).

OBJECTIVE

The objective of the Shaketable RNA is to preserve in as undisturbed a condition as possible the low sagebrush/bunchgrass community and adjoining western juniper savanna and bitterbrush/bunchgrass community. The RNA will serve as a reference area for study, as a baseline area for determining long-term ecological changes, and as a monitoring area to determine effects of management techniques and practices applied to similar ecosystems.

JUSTIFICATION

Shaketable RNA was selected to meet unfilled RNA cell needs for low sagebrush, bitterbrush, and Western juniper communities within the forest zone. The site is representative of transition areas in the Blue Mountains and contains diverse, high quality natural communities (Oregon Natural Heritage Advisory Council 1993 and 2003).

PRINCIPAL DISTINGUISHING FEATURES

Shaketable RNA contains the following principal features:

1. **Low sagebrush/bunchgrass community:** Low sagebrush, in combination with rigid sagebrush, comprises the largest natural community on the RNA, dominating most of the ridge top where Shaketable is located. The community apparently has not burned for some time as the

shrubs are mature and the understory is well developed. Idaho fescue is the dominant bunchgrass in the understory with a wide diversity of forbs present. Scattered western juniper and bitterbrush occurs in the community.

2. **Bitterbrush/bunchgrass community:** On the plateau, within the low sagebrush community, there are sizable patches of bitterbrush/bunchgrass communities. The bitterbrush patches are found on slightly deeper, sandy textured soils compared to low sagebrush sites, which typically occupy shallow rocky soils. The bitterbrush is small in stature but is quite dense. The shrubs show signs of cropping by wildlife.

3. **Western juniper/big sagebrush-bitterbrush/Idaho fescue community:** Western juniper, mixed with ponderosa pine is located along the rimrock surrounding the plateau. The community extends nearly to the eastern boundary of the RNA where ponderosa pine dominates the overstory. The woodland is sparsely covered by western juniper and has a relatively dense cover of bitterbrush, Wyoming big sagebrush (*Artemisia tridentata var. wyomingensis*), and a healthy cover of bunchgrasses dominated by Idaho fescue. Herbaceous species are diverse with *Erigeron bloomeri*, *Antennaria dimorpha*, *Balsamorhiza serrata*, and *Crepis acuminata* being common.

LOCATION

Maps 1, 2, and 3 show the location of Shaketable RNA. The RNA is located on the Blue Mountain Ranger District of the Malheur National Forest. The center of the RNA is at latitude 44°16' 00" north and longitude 119° 24' 12" west. The 385 acre (156 ha.) site lies within Township 15 South, Range 28 East, Sections 17-20, and Township 15 South, Range 27 East Willamette Meridian, Sections 13 (Map 3).

Boundary

Basis of bearing is astronomic north. Basis of elevation is mean sea level as shown on the USGS 7.5 minute topographic quadrangle map Aldrich Mtn. South, Oreg. 1972. A specific boundary description is in Appendix A.

Area

Total area for the Shaketable Research Natural Area is 385 acres (156 hectares). The original acreage identified in the Forest Plan is 375 acres (152 hectares). During the establishment effort in 1997, public scoping was completed for an increase in the size of this RNA to 1,170 acres. It was decided by the Blue Mountain District Ranger to establish the boundary for Shaketable as described in the Forest Plan, with the eastern boundary modified to exclude the gathering

pasture. The reason for the change from what was proposed in the 1997 effort was the specific plant communities identified as targets in the Oregon Natural Heritage Plan (2003) did not include the forested communities adjacent to the plateau. Also there would be less concern with livestock grazing by maintaining the boundary above the riparian areas where grazing routinely occurs and less chance of livestock finding their way up the steep sideslopes to the plateau. Ending the eastern boundary at the Horse Mountain Gathering pasture would exclude plant communities that would not be in near natural conditions.

Elevations

Elevations range from 4,440 feet (1354 m) at the western edge of the RNA to 4745 feet (1446 m) at eastern end of the plateau.

Access

The Shaketable RNA is located on the western edge of the Malheur National Forest (Map 2) approximately 15 miles south southeast of Dayville, Oregon. To access the RNA from Dayville proceed 13 miles east on Hwy 26 to Fields Creek, Forest road 21, and follow that road south 15 miles until it dead ends into the Murderers Creek road, Forest road 2170. Take road 2170 west 2.5 miles to road 2490 and follow road 2490 approximately 2.5 miles to the eastern edge of Shaketable RNA. An unimproved road, 203, heads west from road 2490 to a livestock control gate where one can park their vehicle and proceed upslope on foot to the top of Shaketable RNA.

Maps

Shaketable RNA is located on the USGS 7.5 minute topographic quadrangle map, Aldrich Mtn. South, Oreg. 1972. The Malheur National Forest Recreation Map, 1987, is useful for ownership and general access information, however, this map does not delineate the RNA boundaries.

Photos

The following aerial photos of the Shaketable RNA site are available at the Forest Supervisor's Office and at the Ranger District Office:

3001-127 (7-27-2001)	2701-065 (7-27-2001)
3001-128 (7-27-2001)	2701-066 (7-27-2001)

AREA BY TYPES

Vegetation of the RNA has been surveyed (Vander Schaaf 1989, 1997) during initial recommendation of the site for RNA status as well in preparation for the first draft of this document in 1997. The following determination of cover types and habitat types and their estimated covers have been made from the survey information and from air photo interpretation. Map 4 depicts the locations of the natural communities or associations described below.

The most current information regarding the forested portion of the RNA is described in the plant association guide of Johnson and Clausnitzer (1992). Four plant associations have been identified in the RNA (Map 4), all of which correlate to types described in Johnson and Clausnitzer (1992).

	GIS Acres	Calculated Hectares
SAF Cover Types (Eyre 1980)		
210 Interior Douglas-fir	14	6
237 Interior ponderosa pine	52	21
238 Western Juniper	48	19
Shrubland	238	97
Grassland	33	13
Total	385	156
Kuchler Types (Kuchler 1966)		
11 Western ponderosa pine *(Pinus)*	52	21
12 Douglas-fir forest *(Pseudotsuga)*	14	6
24 Juniper steppe woodland (*Juniperus-Artemisia-Agropyron*)	48	19
51 Wheatgrass bluegrass *(Agropyron-Poa)*	33	13
55 Sagebrush steppe (*Artemisia - Agropyron*)	215	87
Other shrubland *(Cercocarpus-Purshia)*	23	10
Total	385	156
Plant Associations (Johnson and Clausnitzer 1992)		
1) Douglas-fir/elk sedge *(Pseudotsuga mensiezii /Carex geyeri)*	4	2
2) Douglas-fir/mountain mahogany/elk sedge	10	4

(Pseudotsuga mensiezii/Cercocarpus ledifolius/Carex geyeri)		
3) Ponderosa pine/elk sedge	22	9
(Pinus ponderosa/Carex geyeri)		
4) Ponderosa pine/Idaho fescue	30	12
(Pinus ponderosa/Festuca Idahoensis)		
5) Western juniper/Idaho fescue-bluebunch wheatgrass	12	5
(*Juniperus occidentalis/Festuca idahoensis-Agropyron spicatum*)		
6) Western juniper/mountain big sagebrush/Idaho fescue-bluebunch wheatgrass	36	15
(*Juniperus occidentalis/Artemisia tridentata ssp. vaseyana/Festuca idahoensis-Agropyron spicatum*)		
7) Bitterbrush/Idaho fescue-bluebunch wheatgrass	18	7
(*Purshia tridentata/Festuca idahoensis-Agropyron spicatum*)		
8) Low sagebrush/Idaho fescue-bluebunch wheatgrass	215	87
(*Artemisia arbuscula/Festuca idahoensis-Agropyron spicatum*)		
9) Mountain mahogany/elk sedge	5	2
(Cercocarpus ledifolius/Carex geyeri)		
10) Bluebunch wheatgrass/Sandberg's bluegrass	33	13
(Agropyron spicatum/Poa sandbergii)		
Total	385	156

PHYSICAL AND CLIMATIC CONDITIONS

Physical Conditions

Shaketable RNA occupies the upper plateau of a long ridge system in the western portion of the Blue Mountains Physiographic Province. The RNA includes the entire plateau, which stretches for two miles (3.2 km). The side slopes are steep and capped with rimrock, particularly along the southern edge of the plateau, limiting access to the top of the ridge. The steep slopes indicate the boundary of the RNA. Shallow soils predominate over much of the RNA, making the site quite xeric. Soils are derived primarily from aerially deposited pumice mixed with decomposed underlying bedrock.

The top of the plateau is nearly level to gently sloped descending from a high point at the east end down to a low saddle in the middle of the ridge and then again sloping upward toward the northwest. Several deep clefts occur along the edges of the plateau providing easier access to the top than the steep slopes where rimrock occurs. Soils on the plateau are mostly shallow with pockets of deeper soil evident from vegetation patterns and all having high rock content.

The exposed rock and the underlying bedrock include more recent flows of Columbia River basalt as well as deeper sedimentary rock which may date back to the Paleozoic era. A small amount of exposed serpentinite rock is located near the northeast corner of the RNA but it appears to not intrude into the site for any appreciable distance. The geologic quadrangle, the Canyon City Quadrangle (1966), shows the primary bedrock being Columbia River basalt.

Climatic Conditions

The eastern Oregon climate is characterized by warm summers and cold winters with precipitation ranging between 8-20 inches (23-51 cm). Most of the limited precipitation falls as snow during the winter with significant rains often falling during the spring as well. Summers are dry with evening thunderstorms occurring in July and August that typically contribute more lightning than rain. Shaketable RNA is within the Blue Mountains Physiographic Province and receives typical eastern Oregon mountain weather. Summer winds are predominantly from the northwest and are usually light to moderate. East winds may occur in the fall and spring, blowing at higher velocities and causing drying conditions that enhance the fire hazard for the season. During the winter, storms come in from the southwest bringing snow while occasional storms from the northwest bring frigid weather.

The closest recording NOAA weather station with complete yearly records is located in Seneca, Oregon, 30 miles (48 km) to the east of the RNA. A weather station situated at Dayville, Oregon is closer to the RNA but it does not have consistent data to determine average conditions because of missed recordings at the station. Climatic conditions at Seneca should be a fair approximation for Shaketable RNA with differences between the two sites being attributed to the fact that the RNA is located in more mountainous terrain compared to Seneca, which resides in a high valley setting. These differences would likely result in slightly lower average temperature at Seneca than are found at the RNA. The station receives an annual precipitation of 13.15 inches (33.40 cm) and the mean annual temperature is 39.8 °F (4.3 °C) (National Oceanographic and Atmospheric Administration 1995). The Blue Mountains receive significant precipitation during the summer in association with thunderstorms, especially in August and September. Nevertheless, much of the annual precipitation occurs as snow during the winter months. Summer high temperatures regularly reach into the high 80's °F (low 30’s °C), while winter lows often dip into the 20's °F (-2 to -7 °C) or lower. The monthly climatic data for Seneca averaged over the past 54 years is listed below (National Oceanographic and Atmospheric Administration 1995).

Climatic Records for Seneca, Oregon
Elevation 4661 feet (1421 m);
(National Oceanographic and Atmospheric Administration 1995)

Month	Temperature °F	°C	Precipitation inches	cm
January	20.9	-6.2	1.36	3.45
February	26.2	-3.2	1.02	2.59
March	32.0	0	1.18	3.00
April	38.7	3.7	.99	2.51
May	45.9	7.7	1.34	3.40
June	53.5	11.9	1.11	2.82
July	59.0	15.0	.58	1.47
August	57.9	14.4	.87	2.21
September	49.0	9.4	.66	1.68
October	40.4	4.7	.91	2.31
November	31.5	-0.3	1.49	3.78
December	23.1	-4.9	1.64	4.16
Mean Annual	39.8	4.3		
Total Precipitation			13.15	33.40

DESCRIPTION OF VALUES

Flora

The flora of Shaketable RNA is representative of sagebrush steppe vegetation that is common to both the High Lava Plains and the Blue Mountains physiographic provinces. There are three main plant associations that are targeted. The other 7 plant associations have sagebrush steppe characteristics and have plants in common with the target plant associations. The flora has not been systematically collected or studied other than those taxa encountered during surveys conducted during the course of the drafting of the Establishment Record and taxa recorded in ecological inventory plots at the site. No state or federal threatened, endangered or sensitive plant species are known to occur within the RNA. Species identifications were determined from Hitchcock and Cronquist (1973) and Hickman (1993) and trees were determined from Little (1979). Observations and plot data collected by the US Forest Service Area Ecologist, Charlie Johnson (personal communication), and Vander Schaaf (1989, 1997) have resulted in the following list of plants.

Scientific name	Common name
TREES	
Juniperus occidentalis	western juniper
SHRUBS AND SUBSHRUBS	
Artemisia arbuscula	low sagebrush
Artemisia tridentata ssp. vaseyana	mountain big sagebrush
Berberis repens	creeping Oregon grape
Cercocarpus ledifolius	mountain mahogany
Prunus emarginata	bitter cherry
Purshia tridentata	bitterbrush
Ribes cereum	squaw currant
Rosa sp.	rose
Symphoricarpos alba	snowberry
FORBS	
Achillea millefolium	yarrow
Agoseris aurantiaca	orange agoseris
Agoseris grandiflora	large agoseris
Antennaria dimorpha	low pussy-toes
Arenaria congesta	capitate sandwort
Astragalus filipes	basalt milkvetch
Allium acuminatum	tapertip onion
Balsamorhiza hookeri	Hooker's balsamroot
Balsamorhiza sagitata	arrowleaf balsamroot
Blepharipappus scaber	blepharipappus
Calochortus macrocarpus	sagebrush mariposa lily
Castilleja applegatei	Applegate's paintbrush
Cirsium utahense	Utah thistle
Clarkia amoena	clarkia
Collomia grandiflora	large-flowered collomia
Crepis acuminata	long-leaved hawkweed
Cryptantha intermedia	common cryptantha
Delphinium nuttallianum	upland larkspur
Epilobium paniculatum	fireweed
Erigeron bloomeri	scabland fleabane
Erigeron chrysopsidis var. austineae	dwarf yellow fleabane
Eriogonum microthecum	slenderbush buckwheat
Galium aparine	goose-grass
Haplopappus carthamoides	rabbitbrush goldenweed

Hieracium albertinum	western hawkweed
Lactuca serriola	prickly lettuce
Lathyrus lanszwertii	thick-leaved peavine
Lewisia rediviva	bitterroot
Lithspermum ruderale	wayside gromwell
Lomatium triternatum	nineleaf lomatium
Lupinus caudatus	tailcup lupine
Lupinus lepidus var. utahense	prairie lupine
Madia citriodora	lemon-scented tarweed
Mentzelia dispersa	bushy mentzelia
Microsteris gracilis	microsteris
Penstemon deustus	hot rock penstemon
Phacelia heterophylla	virgate phacelia
Phacelia humilis	low phacelia
Phlox hoodii	Hood's phlox
Phlox pulvinata	cushion phlox
Potentilla sp.	cinquefoil
Polygonum majus	wiry knotweed
Scutellaria angustifolium	narrowleaved skullcap
Sedum stenopetalum	wormleaf stonecrop
Senecio integerrimus	western grounsel
Tragopogon dubium	yellow salsify
Zigadenus venenosus	meadow deathcamas

GRAMINOIDS

Agropyron spicatum	bluebunch wheatgrass
Bromus brizaeformis	rattlesnake brome
Bromus carinatus	mountain brome
Bromus commutatus	hairy brome
Bromus tectorum	cheatgrass
Carex geyeri	elk sedge
Danthonia unispicata	onespike oatgrass
Festuca idahoensis	Idaho fescue
Koeleria cristata	prairie junegrass
Poa sp.	bluegrass species
Poa sandbergii	Sandberg's bluegrass
Sitanion hystrix	bottlebrush squirreltail
Stipa occidentalis	Western needlegrass

Shaketable RNA has ten plant associations represented within its boundaries (Map 4). The plateau is dominated by the low sagebrush steppe association and 2 juniper and ponderosa pine associations that are similar except for the dominant shrub or grass understory. Soil depth is a

key environmental determinant for plant communities, with the sagebrush steppe association having shallow rocky soils. The sagebrush steppe association is found on the top of the plateau with the western juniper and ponderosa pine associations found primarily in the rimrock that encircles the plateau.

Low sagebrush with Idaho fescue in the understory is the most common plant association on the Shake Table plateau. The association occurs where soils are slightly deeper and less rocky than where rigid sagebrush is found. The low sagebrush type is quite variable in density of plants as well as in percent cover of understory bunchgrasses. Grass species are also variable with Idaho fescue being the most common species overall but in some areas of more shallow soil there is a considerable amount of Sandberg's bluegrass. In other areas, mixed in with the fescue, is one spike oatgrass (*Danthonia unispicata*) as well as some western needle-and-thread (*Stipa occidentalis*) and prairie junegrass (*Koeleria cristata*). There are places where desert pavement covers considerable open space between the low sagebrush shrubs.

The two western juniper associations occur as an uneven, and sometimes as a narrow band of vegetation in the rimrock at the edge of the plateau. The association is not continuous around the whole of the plateau but is best represented at the eastern end of the site. There are also occurrences of this association on the plateau intermixed with the sagebrush steppe vegetation and it is the dominant association at the northwest tip of the plateau.

Along the southern edges of the plateau where soils are deeper and have a more sandy texture there are areas dominated by bitterbrush (*Purshia tridentata*) with Idaho fescue in the understory. These unusual stands of bitterbrush are almost always adjacent to the western juniper woodlands located in the rimrock. The bitterbrush often appears to be restricted to areas which occupy small terraces slightly below the level of the plateau.

Encircling much of the plateau is a series of rimrock formations that rise vertically 10-20 feet (3-6 m) above the steep hill slopes below. The rimrock is not continuous around the plateau nor is it composed of a single sheer face but rather it is in the form of a number of large rocks and boulders interspersed with pockets of shallow soil. This narrow but distinctive band is dominated by the western juniper/mountain mahogany plant association which has a mostly Idaho fescue understory. The western juniper formation continues onto the plateau at the prominent rise at the east end of the RNA as well as on the long narrow extension of the plateau in the northwest corner of the site. In more level places the western juniper has considerable bitterbrush in the understory while at the lower ends of the band there may be mountain big sagebrush (*Artemisia tridentata ssp. vaseyana*) entering the association.

Fauna

Vertebrate species have not been systematically studied or inventoried in Shaketable RNA. The site is within the Murderers Creek wild horse territory and there is wild horse use evident on the

upper plateau of the RNA. Observations of animal species noted during surveys conducted at the site as well as surveys on nearby areas are included below. The following terrestrial vertebrates are ones most likely to be encountered in the RNA (Burt and Grossenhieder 1976; National Geographic Society 1987; Nussbaum et al 1983).

Scientific name	Common name
Iguanidae	
Phrynosoma douglasii	Short-horned lizard
Sceloporus occidentalis	Western fence lizard
Sceloporus graciosus	Sagebrush lizard
Uta stansburiana	Side-blotched lizard
Scincidae	
Eumeces skiltonianus	Western skink
Teiidae	
Cnemidophorus tigris	Western whiptail snake
Boidae	
Charina bottae	Rubber boa
Colubridae	
Coluuber constrictor mormon	Western yellowbelly racer
Hypsiglena torquata	Night snake
Masticophis taeniatus	Striped whipsnake
Pituophis melanoleucus	Gopher snake
Thamnophis elegans	Western terrestrial garter snake
Thamnophis sirtalis	Common garter snake
Viperidae	
Crotalus viridus	Western rattlesnake
Ambystomatidae	
Ambystoma macrodactylum	Long-toed salamander
Bufonidae	
Bufo boreas	Western toad
Pelobatidae	
Speo intermontana	Great Basin spadefoot toad
Cathartidae	
Cathartes aura	Turkey vulture
Accipitridae	

Buteo jamaicensis	Red-tailed hawk
Buteo regalis	Ferruginous hawk
Buteo swainsonii	Swainson's hawk
Aquila chrysaetos	Golden eagle
Falconidae	
Falco sparverius	American kestrel
Falco mexicanus	Prairie falcon
Phasianidae	
Alectois chukar	Chukar
Bonasa umbellus	Ruffed grouse
Callipepla californica	California quail
Meleagris gallopavo	Wild turkey
Caprimulgidae	
Chordeiles minor	Common nighthawk
Trochilidae	
Archilochus alexandri	Black-chinned hummingbird
Selasphorus platycercus	Broad-tailed hummingbird
Selasphorus rufus	Rufous hummingbird
Stellula calliope	Calliope hummingbird
Picidae	
Picoides albolarvatus	White-headed woodpecker
Colaptes auratus	Northern flicker
Tyrannidae	
Empidonax minimus	Least flycatcher
Empidonax oberholseri	Dusky flycatcher
Empidonax trailii	Willow flycatcher
Empidonax wrightii	Gray flycatcher
Myiarchus cinerascens	Ash-throated flycatcher
Sayornis saya	Say's phoebe
Tyrannus verticalis	Western kingbird
Hirundinidae	
Hirundo pyrrhonota	Cliff swallow
Stelgidopteryx serripennis	Northern rough-winged swallow
Tachycineta bicolor	Tree swallow
Tachycineta thalassina	Violet-green swallow
Corvidae	

Perisoreus canadensis	Gray jay
Cyanocitta stelleri	Steller's jay
Corvus corax	Common raven
Gymnorhinus cyanocephalus	Pinyon jay
Paridae	
Parus atricapillus	Black-capped chickadee
Parus gambeli	Mountain chickadee
Troglodytidae	
Catherpes mexicanus	Canyon wren
Salpinctes obsoletus	Rock wren
Thryomanes bewickii	Bewick’s wren
Troglodytes aedon	House wren
Muscicapidae	
Catharus ustulatus	Swainson's thrush
Sialia currucoides	Mountain bluebird
Sialia mexicana	Western bluebird
Turdus migratorius	American robin
Laniidae	
Lanius ludovicianus	Loggerhead shrike
Bombycillidae	
Bombycilla cedorum	Cedar waxwing
Sturnidae	
Sturnus vulgaris	European starling
Vireoniidae	
Vireo solitarius	Solitary vireo
Emberizidae	
Amphispiza belli	Sage sparrow
Dendroica coronata	Yellow-rumped warbler
Dendroica nigrescens	Black-throated gray warbler
Dendroica petechia	Yellow warbler
Oporonis agilis	MacGillivray's warbler
Wilsonia pusilla	Wilson's warbler
Chlorura chlorura	Green-tailed towhee
Sternella neglecta	Western meadowlark
Passerina amoena	Lazuli bunting
Passerculus sandwichensis	Savannah sparrow

Pheucticus melanocephalus	Black-headed grosbeak
Pooecetes gramineus	Vesper sparrow
Chondestes grammacus	Lark sparrow
Spizella breweri	Brewer's sparrow
Junco hyemalis	Dark-eyed junco
Melospiza melodia	Song sparrow
Molothrus ater	Brown-headed cowbird
Vermivora ruficapilla	Nashville warbler

Fringillidae

Carpodacus cassinii	Cassin's finch
Carpodacus mexicanus	House finch
Loxia curvirostra	Red crossbill
Carduelis pinus	Pine siskin
Coccothraustes vespertinus	Evening grosbeak
Pinicola enucleator	Pine grosbeak

Soricidae

Sorex merriami	Merriam’s shrew
Sorex obscurus	Dusky shrew
Sorex preblei	Malheur shrew
Sorex vagrans	Vagrant shrew

Vespertilionidae

Myotis lucifugus	Little brown myotis
Myotis yumanensis	Yuma myotis
Myotis evotis	Long-eared myotis
Myotis subulatus	Western small-footed bat
Myotis volans	Long-legged myotis
Myotis californicus	California myotis
Anthrozous pallidus	Pallid bat
Lasionycteris noctivagrans	Silver-haired bat
Eptesicus fuscus	Big brown bat
Euderma maculata	Spotted bat
Pipistrellus hesperus	Western pipistrelle
Plecotus townsendii	Townsend's big-eared bat

Leporidae

Lepus americanus	Snowshoe hare

Sciuridae

Eutamias minimus	Least chipmunk
Eutamias amoenus	Yellow-pine chipmunk

Citellus beldingi	Belding's ground squirrel
Citellus columbianus	Columbian ground squirrel
Citellus lateralis	Golden-mantled ground squirrel
Marmota flaviventris	Yellow-bellied marmot
Tamiasciurus hudsonicus	Red squirrel
Geomyidae	
Thomomys talpoides	Northern pocket gopher
Heteromyidae	
Perognathus parvus	Great Basin pocket mouse
Dipodomys ordi	Ord kangaroo rat
Cricetidae	
Clethrionomys gapperi	Southern red-backed vole
Microtus longicaudus	Longtail vole
Microtus montanus	Mountain vole
Microtus richardsoni	water vole
Onychomys leucogaster	Northern grasshopper mouse
Peromyscus crinitus	Canyon mouse
Peromyscus maniculatus	Deer mouse
Reithrodontomys megalotis	Western harvest mouse
Neotoma cinerea	Bushy-tailed woodrat
Lagurus curtatus	Sagebrush vole
Zapodidae	
Zapus princeps	Western jumping mouse
Erethizontidae	
Erethizon dorsatum	Porcupine
Canidae	
Canis latrans	Coyote
Ursidae	
Ursus americanus	Black bear
Mustelidae	
Gulo gulo	California wolverine
Mustela erminea	Short-tailed weasel
Mustela frenata	Long-tailed weasel
Taxidea taxus	Badger
Felidae	
Felis rufus	Bobcat

Felix concolor	Mountain lion
Cervidae	
Odocoileus hemionus	Mule deer
Cervus canadensis	Elk
Antilocapridae	
Antilocapra americana	Pronghorn
Bovidae	
Ovis canadensis	Bighorn sheep

Aquatic

There are no aquatic habitats represented at Shaketable RNA. On top of the plateau two wildlife guzzlers were installed that collect precipitation and make it available to wildlife within fenced enclosures. The guzzlers are not situated in conjunction with any springs or seeps at the site and therefore have no aquatic features associated with them.

Geology

The geology of Shaketable RNA has not been studied in detail and texts of Oregon geology do not address the area except in the most general terms (Baldwin 1964). The site is near, however, some of the more well studied geologic formations in the state, including the John Day and Rattlesnake Formations, which are well known for their rich fossil deposits that date from the Eocene, approximately 35 million years ago. The earliest formations which appear at the surface of the RNA are ultramafic intrusions of serpentinite, a complex metamorphosed sedimentary deposit that is known for its concentrations of heavy metals. These deposits, located only at the extreme northeastern corner of the RNA, date from the Triassic period. The remainder of the RNA is composed primarily of Columbia River basalt that dates from 15-18 million years ago. The geologic quadrangle for the area, the Canyon City Quadrangle (USDI Geological Survey 1966), shows the primary bedrock for the site as being Columbia River basalt.

The site occupies a long ridge system whose nearly level top is essentially a plateau. The top of the ridge is capped with Columbia River basalt, a very hard formation that flowed from ground fissures during the Miocene and covered vast areas of the Pacific Northwest. The formation is composed of numerous individual flows. Shake Table's distinctive plateau-like appearance is directly related to the erosion resistance of the Columbia River basalt. It is likely that disconformities in the flows allowed precursors to Murderers Creek to flow in the approximate area of its present day channel thereby bypassing the resistant layers of basalt and downcutting

the more easily eroded underlying sedimentary layers. The downcutting was relatively rapid resulting in steep hill slopes while the basalt cap on top of the plateau has continued to resist subsequent erosion from the elements.

The most recent geologic event that has affected the site was the explosion of Mt. Mazama over 7,000 years ago, which sent air borne pumice over the High Lava Plains and the Blue Mountains, creating deposits that ranged widely in depth depending upon proximity to the site of origin and colluvial action. The rapid decomposition of the pumice resulted in unique soils being formed in the Blue Mountains which then fostered many of the vegetative communities that are present there today.

Soils

The soils in the Shaketable RNA are generally characterized as being shallow, gravelly residual soils on slopes of less than 15%. The RNA has extremely shallow rocky soils that limit vegetation growth to low sagebrush communities. The Malheur Forest Soil Resource Inventory (1974) shows seven soil mapping units present within the boundary of the RNA (Map 5). Mapping units are analogous to soil types with special reference made to the landforms on which they are found as well as to the vegetation present on them. Some of the mapping units shown on Map 5 are combined with the letter "C" between the mapping units, which is not used in the following descriptions.

Mapping Unit 3:
Soil map unit 3 may have inclusions of various other landtypes. Typically this soil occurs along stream bottoms and other areas that are wet for a portion of the summer. These areas may or may not be sub-irrigated during the growing season. The surface soils are generally high in organic matter. Soil texture ranges from silt loam to loam to clay loam and some clays. Soil depth is greater than 24 inches. Slopes generally range from 1 to 15%. Dominant vegetation on this soil is Kentucky bluegrass and tufted hairgrass. This soil can be highly susceptible to gully and streambank erosion if ground cover and streambank vegetation are allowed to deteriorate.

Mapping Unit 8X/9X:
Soil mapping units 8X and 9X are considered to represent miscellaneous landtypes that have a wide range of undefined soil characteristics. At Shaketable RNA these mapping units are located in the northeast corner of the site, including the steep slopes that descend from the highest point on the RNA. Slopes range from 15 to 100 percent and can have a variable aspect. Bedrock is typically highly stratified and variable with inclusions of serpentinite noted from the extreme eastern edge of the RNA. Soil texture varies from loam to clay and there may be an 8 to 12 inch recent volcanic ash surface layer in places. Dominant vegetation includes ponderosa pine and Douglas-fir in the overstory and pinegrass, elk sedge, and bunchgrasses in the understory. The mapping unit has had landslide and slump activity in the past.

Mapping Unit 44/45:
Soil mapping units 44 and 45 are found together in this mapping unit complex, intermixed at a level that is too fine to distinguish between at the scale they were mapped. The mapping unit complex occurs on steep south-facing slopes that have gradients of 30 to 70 percent. Soil depths are shallow, ranging from 4 to 15 inches. The soil is a gravelly to cobbly loam soil derived from weathered basalt and andesite. Gravel and cobble content increase with soil depth, ranging upwards to 70 percent by volume. The surface layer is vary dark grayish brown to dark brown gravelly and cobbly loam with weak, fine and very fine, crumb and granular structure. Rock fragments cover 40 to 70 percent of the soil surface. Where soils are deeper the site supports western juniper and mountain mahogany but where soils are very shallow big and low sagebrush is the dominant vegetation. Understories in both types are bunchgrasses including bluebunch wheatgrass, Idaho fescue and Sandberg's bluegrass.

Mapping Unit 44/48:
Soil mapping units 44 and 48 are found together in this mapping unit complex, intermixed at a level that is too fine to distinguish between at the scale they were mapped. The mapping unit complex occurs on steep north-facing slopes that have gradients of 30 to 70 percent. Soil depths vary greatly with mapping unit 44 having soil depths ranging from 8 to 15 inches while mapping unit 48 has deeper soils ranging from 18 to 48 inches in depth. In places that correlate more closely with mapping unit 48, the surface soil is a silt loam 6 to 12 inches thick that is derived from volcanic ash that originated from Mt. Mazama. In other sites within the complex there is no volcanic ash derived surface soil and the soil is essentially equivalent to the subsoil which is described as a gravelly cobbly loam and clay loam derived from weathered basalt, andesite and tuffaceous interflow material. Gravel and cobble content increase with soil depth, ranging upwards to 50 percent by volume. The surface layer is very dark grayish brown to brown silt loam and it is characterized by having massive structure. The subsurface layer is dark brown to brown with some reddish brown gravelly or cobbly loam and clay loam; the soil has moderate to strong, fine angular and subangular blocky structure. Where soil depth is sufficient the mapping unit complex supports ponderosa pine and Douglas-fir with pinegrass and elk sedge in the understory but where soils are shallow they support western juniper, mountain mahogany and bunchgrasses.

Mapping Unit 47:
Soil mapping unit 47 occupies the upper plateau of Shake Table, an area that has level to rolling terrain and considerable surface rock. Soils in this mapping unit are excessively drained and classed as gravelly to very gravelly and cobbly loam that has been derived from weathered basalt and andesite. Soil depths range from 4 to 12 inches. Soil color is very dark grayish brown to dark brown and the structure is weak, fine to very fine, crumb and granular with 30 to 70 percent gravel and cobble by volume. The mapping unit supports stiff and low sagebrush with an understory of bluebunch wheatgrass and Sandberg's bluegrass.

Mapping Unit 81:

Typically map unit 81 is found on upland flats, sideslopes, and toeslopes with gradients less than 30%. It has deep soils with depth ranging from 24 to 72 inches. It supports ponderosa pine with ground cover of fescue, elk sedge, and pinegrass. This soil is moderately well to poorly drained with moderately slow permeability in the surface soil, and very slow in the subsoil. It has a clay loam surface soil and a gravelly and cobbly clay loam and clay subsoil. Soil material is derived from altered tuffs and breccias.

Mapping Unit 96/98:
Map unit 96 and 98 are found together on Shake Table. These soils are typically found on southerly-facing ridge tops and slopes with gradients less than 30 percent. They support ponderosa pine, juniper, big sagebrush, and mountain mahogany with ground cover of wild onion, wheatgrass, fescue, Sandberg's bluegrass, and elk sedge. One difference in map units 96 and 98 is the depth of soils and the extent of drainage in the soil. Soil in map unit 96 is deeper, 12 to 24 inches, that support pine, is well to moderately well drained, and has gravel and cobble content from 20 to 40%. Soil in map unit 98 is shallow, 4 to 12 inches, is excessively drained, and has gravel and cobble content ranging from 50 to 80%. These soils have loam to very gravelly and cobbly loam and gravelly and cobbly loam to clay loam derived from serpentine and peridotite bedrock.

Lands

Shaketable RNA is bordered all the way around by lands which are managed by the Malheur National Forest. The west end is within ½ mile of land managed by the Murderers Creek Wildlife Management Area of the Oregon Department of Fish & Wildlife (ODFW). Land around the RNA is classified as Management Area 10 in the Malheur Forest Plan (1990a) and is managed for semi-primitive non-motorized recreation. One of the primary goals for the management area is to protect existing environmental quality. No new roads will be constructed within Management Area 10. There is no scheduled timber harvest but livestock grazing is permitted in accordance with Forest wide standards with the exception that livestock improvements will not be compatible with the primary direction of the area. Less than a quarter mile to the east of the RNA is a different Malheur Forest management area, Management Area 4A--Big-Game Winter Range. The goal of this area is to maintain usable forage for big game on potential winter range. Timber harvest and livestock grazing may occur within Management Area 4A as long as forage and habitat concerns of big game are given priority in potential management actions.

Land near the western boundary of the RNA, in the ODFW Murderers Creek Wildlife Management Area, is managed to provide habitat for a variety of game species including mule deer, elk, upland game birds, and nongame species which are found in the area. The wildlife management area is centered on Murderers Creek but also includes portions of the South Fork John Day River as well as lands on the north slopes of Aldrich Mountain. The ODFW lands are not actively managed or manipulated and are in high quality natural condition.

The entire RNA and surrounding land under Forest Service and ODFW ownership is within the Murderers Creek Wild Horse Territory. This area is managed to maintain the Murderers Creek wild horse herd at 100 animals (USDA 1990a).

Cultural

Obsidian flakes have been found on Shake Table by casual observers. The area may have been used as a travel corridor between the South Fork John Day River and Bear Valley in prehistoric times. No historical structures exist at the site. A complete cultural resources inventory has not been conducted in the RNA.

IMPACTS AND POSSIBLE CONFLICTS

Grazing Resources

Shaketable RNA is within the Murderer's Creek grazing allotment on the Blue Mountain Ranger District of the Malheur National Forest. The steep slopes and lack of water in the RNA limited grazing pressure and signs of grazing were mostly observed to the north on a small section of the lower north-facing slope. At the time Shaketable RNA was proposed, it was in excellent natural condition due to steep, rough terrain that largely excludes livestock grazing. In the past few years range use by livestock has changed, largely due to issues of grazing in riparian areas and litigation. Permittees have been diligent about moving livestock out of the sensitive riparian areas along Murderer's Creek and South Fork Murderer's Creek surrounding Shake Table. The result has been a slight increase in use on the plateau. Within the last 2 years there was one report of 150 trespass cows on the plateau, but the livestock report was unconfirmed. The incidental use in recent years is not expected to have altered the plant communities or condition. The plateau is within a wild horse territory and has a horse trap at one point along the southeast boundary. The wild horse herd has been in the area for years and still the RNA area was identified as a place that was in excellent condition. Regular monitoring of livestock use on the plateau will need to be completed regularly, yearly or every other year. If livestock use increases above what is thought as incidental use, a change in the grazing strategy may be necessary to protect the natural conditions within the RNA.

Mineral Resources

There are no reported hardrock mining claims in Shaketable RNA. Mineral resources are not usually associated with lands such as those found within the RNA. The RNA will be proposed for withdrawal of mineral entry upon formal establishment.

Timber Resources

The RNA is surrounded by Malheur National Forest lands whose primary goal is to provide semi-primitive non-motorized recreation opportunities (Management Area 10). Lands within this management area are considered to be unsuitable for timber harvest. To the east of this management area are lands within Management Area 4A whose primary goal is to maintain mule deer winter range but may be classified as suitable for timber management so long as it is compatible with the primary goal (USDA Forest Service 1990b). Designation and establishment of the RNA will remove the site from potential timber harvest but even without designation the site would have likely been classified as unsuitable (Management Area 10).

There are no timber resources within the RNA boundary and scheduled timber harvest will not occur in the RNA. There are no roads crossing Murderer's Creek to access the timber resource along the northern boundary of the RNA. The RNA and adjacent Forest Service managed land is within a semi-primitive non-motorized recreation area, therefore the possibility for timber harvest is remote on land adjacent to the RNA.

Watershed Values

No significant watershed values are within the RNA boundary. There are significant watershed values near Shaketable RNA, as the site is located above the confluence of two forks of Murderers Creek, the mainstem and the South Fork, which is a major tributary of the South Fork of the John Day River system in central Oregon. Murderer's Creek is a large drainage basin which is known for having extensive riparian systems in relatively good condition. The portions of Murderer's Creek near the border of the RNA are below steep terrain and exhibit narrow riparian systems. The drainage contains high quality native fisheries including inland redband trout and steelhead and supplies a substantial quantity of water to the South Fork of the John Day, which also has a summer steelhead run. Shake Table functions as a large moisture collection area in high quality natural condition. The shallow soils that predominate over most of the site preclude much long-season storage of moisture but the site, nevertheless, figures prominently in the overall water quality for Murderer's Creek.

Recreation Values

Shaketable RNA receives limited recreation use, primarily in the fall from hunters. Casual recreation use has not seriously impacted the RNA to date. Recreational use and identification of the site as an RNA on general forest recreation maps should be discouraged.

Wildlife and Plant Values

There have been no listed threatened or endangered wildlife or plant species located within the RNA to date. Two sensitive species, California wolverine and the gray flycatcher, have the potential to occur within the boundary. The gray flycatcher is suspected of occurring on the Malheur and may be found along the openings at the eastern edge of the RNA. California wolverine are documented on the Malheur and may travel through the RNA, due to its low human use and unroaded character. The RNA does not have habitat values for a wolverine home range. Establishing the area as an RNA would have no affect on either of those species, and may help to protect habitat.

In the early 1980's a resource management plan was coordinated between federal and state agencies and Oregon State University. One of the projects from that plan was the installation of guzzlers for wildlife. Two guzzlers were installed on Shake Table with the intent to provide a water source for antelope, and other big game, and especially for upland game birds such as the chukar. Conditions along the streams at the bottom of the plateau were less than desired, due to overgrazing by livestock. The guzzlers provided a water source to upland game birds and helped with distribution of the birds to areas where forage and cover was available. The group of people who established the plan was concerned that if livestock distribution spread out, the cattle may end up grazing on the plateau. For that reason, exclosures, about ¼ acre, were constructed around each of the guzzlers. Records for the guzzlers show a high need for maintenance since the late 1980's. There have been ongoing problems with rusty float valves, leaky tank, shut off valve not turned off in the fall, and neither guzzler has been turned back on since 1999. There was a valid reason for installing the guzzlers and either maintenance needs to be done on both of them or they should be removed, along with the exclosure fencing.

Special Management Area Values

There are no congressionally designated or special management areas within or adjacent to the RNA such that establishment of the RNA will not affect any of these types of areas.
The RNA is within the Murderer's Creek Wild Horse Territory which is an administrative designation that is recognized by the Malheur National Forest, the Murderers Creek Wildlife Management Area (ODFW), and the Bureau of Land Management. This territory has a management objective to maintain a wild horse herd averaging 100 head with a range of 50-140 head. Use by wild horses with the RNA is occasional and does not interfere with the overall composition and structure of vegetation for which the area was selected.

Adjacent Private Lands

There are no private lands immediately adjacent to the RNA.

MANAGEMENT PRESCRIPTION

Management and protection of Shaketable RNA will be directed towards maintaining natural ecological processes. Activities that disturb or modify ecological processes will be discouraged or eliminated.

Shaketable RNA is included, along with other RNAs, in the Malheur National Forest Plan in Management Area 9 (USDA Forest Service 1990b). Standards and guidelines for management of the area are described in the Forest Plan.

Vegetation Management

Standards and guidelines for RNAs, Management Area 9, address vegetation management under several main resource headings (USDA Forest Service 1990b). The overall management direction for all RNAs is to preserve the naturally occurring physical and biological processes. No scheduled timber harvest will occur in the natural area and firewood cutting will be prohibited.

Wildfire will be actively suppressed unless a fire management plan approved by the Director of the Pacific Northwest Research Station provides for letting natural fires burn under specific prescriptions. Fire suppression will use methods and equipment that will minimize disturbance to the special features of the area. Prescribed burning will be used only as specified in approved research projects or when needed to meet RNA management goals.

Other natural ecological processes such as insect and disease outbreaks shall not be suppressed within the RNA unless they threaten lands outside the RNA boundaries. Monitoring of the RNA is recommended in order to track any outbreaks that may occur.

Introduced species and weedy native species are a concern at the RNA. At this time cheatgrass (*Bromus tectorum*) is the only known significant weed infestation in the RNA, occurring scattered in patches across the plateau in sagebrush steppe vegetation. Monitoring in the form of annual surveys of the RNA should be conducted to detect weedy invasions and to track the spread of cheatgrass into other natural communities in the natural area.

Transportation Plan

No roads or trails occur in the RNA nor are any planned for this area. No conflicts exist between transportation plans and establishment of the RNA.

Fences and Protective Barriers

Fencing for livestock exists along the eastern edge of the RNA. A drift fence exists at the northwest corner and extends east and west from the bottom of the steep slope to nearly the top of the plateau. Livestock would be permitted within the boundary only where essential to maintain a specific vegetative type for which the RAN is established (USDA Forest Service 1990b). Boundary fencing may be used where necessary to exclude livestock.

Signs currently exist at the northwest portion of the upper plateau of the RNA indicating that the National Forest boundary is nearby. Signs will need to be placed around the boundary after the establishment process is complete.

ADMINISTRATION RECORDS AND PROTECTION

Administration and protection of Shaketable RNA will be the responsibility of the Malheur National Forest. The District Ranger, Blue Mountain Ranger District, has direct responsibility for management of the RNA.

The Director of the Pacific Northwest Research Station will be responsible for any studies or research conducted in the area, and requests to conduct research in the RNA should be referred to that office. The RNA Scientist in the Research Station is designated as the lead contact person for all such requests. The Director will evaluate research proposals and coordinate all studies and research in the area with the District Ranger. All plant and animal specimens collected in the course of research conducted in the area will be properly preserved and maintained within university or federal agency herbaria and museums, approved by the Pacific Northwest Research Station.
Records for the Shaketable RNA will be maintained in the following offices:

Forest Supervisor, Malheur National Forest, John Day, Oregon
District Ranger, Blue Mountain Ranger District, John Day, Oregon
Director, Pacific Northwest Research Station, Portland, Oregon
Forest Sciences Laboratory, Corvallis, Oregon

Archiving

The Portland office of the Pacific Northwest Research Station will be responsible for maintaining the Shaketable RNA research data file and list of herbarium and species samples collected. The Forest Sciences Lab in Corvallis, Oregon maintains research data and lists of species for all RNAs in the Region, in conjunction with the Oregon Forest Science Databank. Computerized files for the RNA will be maintained at the Forest Sciences Lab.

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SHAKETABLE RESEARCH NATURAL AREA

ENVIRONMENTAL ASSESSMENT

USDA, Forest Service
Blue Mountain Ranger District
Malheur National Forest
Grant County, Oregon

Lead Agency:

USDA Forest Service
Malheur National Forest
P.O. Box 909
John Day, OR 97845

Responsible Official:

Regional Forester
Pacific Northwest Region
P.O. Box 3623
Portland, OR 97208

INTRODUCTION

This environmental assessment evaluates the proposal to amend the Malheur National Forest Land and Resource Management Plan, changing the status of the proposed Shaketable Research Natural Area (RNA) on the Blue Mountain Ranger District to an established RNA status. This assessment will document the analysis of the Proposed Action and the No Action Alternative.

Environmental Setting

Shaketable RNA is located in T. 15 S., R 27 E., Section 13 and in T. 15 S., R. 28 E., Sections 17 – 20 which is approximately 15 miles (23 km) southeast of Dayville, Oregon (see maps in Appendix A). The RNA is composed of intact plant communities that can serve as benchmarks for comparison with areas of similar vegetation that are intensively used. The proposed RNA is located entirely within the boundaries of the Shake Table Semiprimitive Nonmotorized Area (MA-10). The majority of the RNA is also within the boundary of the Shake Table Inventoried Roadless Area, as designated under the Roadless Area Conservation Rule (USDA Forest Service 2001a). See Appendix A. A full description of the Shaketable RNA is found in the Establishment Record.

PURPOSE AND NEED FOR ACTION

The purpose of formally establishing Shaketable RNA is to contribute to a network of RNAs designated to "illustrate adequately or typify for research or education purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance" (36 CFR 251.23). The proposed Shaketable RNA contributes to this network of RNAs by providing an example of Western juniper/low sagebrush/bunchgrass, low sagebrush/Idaho fescue, rigid sagebrush/Sandberg's bluegrass, and bitterbrush/bunchgrass woodland identified by the Oregon Natural Heritage Advisory Council (Oregon Natural Heritage Advisory Council 2003). An evaluation by the Regional RNA Committee, pursuant to direction in the Forest Service Manual (FSM) 4063.04b, identified this vegetation type as suitable and desirable for inclusion in the national network. Establishment of this RNA will provide long-term protection and recognition of this vegetation type.

Shaketable RNA was proposed as a candidate RNA in the 1990 Final Environmental Impact Statement for the Malheur National Forest Land and Resource Management Plan (Forest Plan), and the 1990 Land and Resource Management Plan Record of Decision (USDA Forest Service 1990a, 1990b, 1990c). This environmental assessment tiers to the Malheur Land and Resource Management Plan Final Environmental Impact Statement and Record of Decision (1990) and incorporates by reference the accompanying Land and Resource Management Plan (Forest Plan), as amended.

Site conditions have not significantly changed since the RNA was proposed during the land management planning process. Since the majority of the RNA is located within an Inventoried Roadless Area (IRA), the main mechanism for change would be wildfire. In 2006, there were several spot fires associated with the Shaketable Complex Fire within the IRA. Figure 2, located in the Appendix, shows that the spot fires varied in size and location. None of the spot fires were located within or adjacent to the boundaries of the RNA.

An Establishment Record has been prepared and completed for Shaketable RNA. It now remains to formally convert this RNA from candidate to established status. This conversion is accomplished by amending the Forest Plan through a Designation Order/Decision Notice. The purpose of amending the Forest Plan is to formally establish this RNA as a part of the Research Natural Area System.

PROPOSED ACTION

The proposed action is to formally establish Shaketable RNA, which was a proposed RNA in the Forest Plan. This RNA will be managed according to the direction provided in the management plan (Chapter IV, MA-9, pages IV-95 and IV-96). This proposed action of formally designating the RNA by the Regional Forester, will amend the Forest Plan.

Issues

A Nature Conservancy specialist initiated and prepared a draft Establishment Record in 1997. The draft was edited in 2005 to reflect changes in the size of the proposed Shaketable RNA and other editorial changes suggested by the regional RNA specialist.

Public participation in this project began when a scoping letter and map were mailed to interested publics on October 15, 1997. Two comments were received, one with comments favorable to establishing the RNA and one opposed. At that time the Shaketable RNA was proposed to be expanded from 375 acres to 1,170 acres. The one respondent opposed to establishing the RNA disagreed with increasing the size because the additional plant communities were different ecosystems that needed to be independently analyzed. The respondent expressed concern that significant changes in Forest Plan land allocations were involved and the effects on management of other resources and changes in outputs needed to be disclosed.

Public scoping was initiated again on May 25, 2005. Letters were sent to 13 interested parties. On October 5, 2005 a legal notice was published in the Blue Mountain Eagle notifying the public of the availability for review of the Environmental Assessment. The Shaketable Proposed RNA is about 385 acres, resulting from a minor refinement of the boundaries of the 375 acre area identified in the 1990 Forest Plan. The additional plant communities proposed in the 1997 scoping for Shaketable RNA have been removed. The Forest received one comment from the same organization (but by a different representative of that organization) who made comments against the proposal in 1997. The respondent is

opposed to formal designation as an RNA, but not opposed to allocating and managing the area as RNA. The respondent wrote that the formal establishment would take away the ability to protect and preserve the area because it is ripe for a large fire, which would destroy the very things the Forest Service was trying to protect. He is opposed to an increase in the size of the RNA.

ALTERNATIVES

Proposed Action

This action would designate in perpetuity approximately 385 acres on the Blue Mountain Ranger District, Malheur National Forest as the Shaketable RNA (see the Establishment Record section titled Location and Boundaries, page 3, USDA Forest Service 2005). Once established, the Forest Service Pacific Northwest Research Station would develop a management plan specific to Shaketable RNA. Management of the area will be followed as outlined in the Forest Plan, pages IV-95 and IV-96 (USDA Forest Service 1990b). The objective is to maintain the natural condition of the area. There would be no permitted livestock grazing, although incidental use the same as in the past may occur; no fuelwood, timber products, or minerals will be removed; fire suppression will be limited; recreational use will be discouraged; and no roads or trails will be constructed.

No Action

Under the No Action Alternative, the candidate area would continue to be managed as a proposed RNA as directed in the Forest Plan. Management direction will continue until the Forest Plan is revised or replaced. The only difference between this no action alternative and the proposed action is the formal designation of the area as a RNA.

ENVIRONMENTAL EFFECTS

Proposed Action

Amending the Forest Plan to formally establish Shaketable RNA is an administrative action lacking environmental effects. Consequently, neither alternative will have an effect on public health, safety, cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers areas deemed ecologically critical, sites listed or eligible for listing in the National Register of Historic Places, endangered or threatened species or its habitat determined to be critical under the ESA of 1973, or threaten a violation of Federal, State, or local law imposed for the protection of the environment. The Proposed Action is not highly controversial as evidenced by the number and tone of the responses received from the public during the 1997 and 2005 scoping process. The Action being proposed does not involve unique or unknown risks. It does not establish a precedent as proposed Research Natural Areas have been established on the Malheur National Forest and elsewhere in Region 6. Since this is an administrative action, there will be no cumulatively significant impacts on the environment.

In addition, there are no known significant mineral resources within the area. The RNA is within land open to oil and gas leasing, but there are not any active leases. If oil was discovered under the butte, we would request side-cast drilling from the bottom disturbed lands, therefore, not disturbing habitats within the RNA. Recreation use is minimal and is expected to remain so. As there are no commercially valuable timber resources in the area, no loss of timber utilization is anticipated. No threatened or endangered plants or animals would be affected by establishment of the area. No roads or trails exist within the area nor is there a need for such. Environmental consequences disclosed in the Forest plan Final Environmental Impact Statement are still valid, and conditions and effects have not changed. The only difference between the two alternatives is that the Proposed Action gives the designation more permanency. This could foreclose future options in the unlikely event of something new becoming known. See the Establishment Record, Impacts and Possible Conflicts, pp. 22 – 24 (located in the Appendix) for more details (USDA Forest Service 2005).

CONSULTATION WITH OTHERS

This proposed action was identified in a May 25, 2005 scoping letter with opportunity for public comment. This action has also been listed in the Schedule of Proposed Actions since Spring 2005. Public comments are in Appendix of this document.

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