

VEGETATION MAP OF THE PROPOSED
ROCKY COMFORT FLAT
RESEARCH NATURAL AREA,
PAYETTE NATIONAL FOREST

by

Robert K. Moseley
Natural Heritage Section
Nongame/Endangered Wildlife Program
Bureau of Wildlife

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Idaho Department of Fish and Game
600 South Walnut, P.O. Box 25
Boise, Idaho 83707
Jerry M. Conley, Director

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INTRODUCTION

Rocky Comfort Flat proposed Research Natural Area (pRNA) is a plateau-like peninsula surrounded on all but the eastern side by canyons of Bear Creek and Crooked River, upstream from their confluence. The plateau is gently undulating and breaks abruptly to steep-sided canyon walls that drop approximately 1,000 feet to the valley bottoms.

The pRNA is located on the Weiser Embayment of the Columbia River Basalt Group, which is the southeasternmost extension of the Columbia Plateau. Two flows are present in the pRNA (Fitzgerald 1982): Imnaha Basalt, the oldest flow, is exposed on the lower canyon slopes where it underlies the younger Grande Ronde Basalt, which comprises a majority of the area.

The high topographic and edaphic complexity of the 1,100 acre area creates a complex mosaic of habitats. Because of this, the biological diversity of the pRNA is relatively high for its size.

VEGETATION MAPPING

The Idaho Natural Heritage Program was contracted to inventory and map plant associations of the pRNA. The specific tasks were as follows:

1. Inventory the Rocky Comfort Flat pRNA, as identified in the Payette Forest Plan, for all plant associations, with special emphasis on stiff sagebrush types.
2. Document the location of plant associations on aerial photos and maps, and provide a short narrative report describing the importance of these associations for protection and future study.
3. Document associations larger than one acre and sensitive plant population occurrences upon aerial photos and topographic and orthoquad maps.

The field inventory was conducted by three Heritage Program biologists on September 24, 1990. Orthoquads (Map 1) and aerial photos of the pRNA, showing the distribution of plant associations, accompany this report. Sixteen mapping units were used to encompass the range of vegetative diversity of the area. Mapping unit descriptions appear in the next section, along with a short statement of the conservation status of each community encountered. I mapped rare plant populations on a separate map (Map 2) to reduce cluttering on the vegetation map.

MAPPING UNIT DESCRIPTIONS

Unit 1 Artemisia tridentata ssp. vaseyana/Festuca idahoensis
 (mountain big sagebrush/Idaho fescue) habitat type

See Hironaka et al. (1983) and Johnson and Simon (1987) for a description of this association. It should be noted, however, that the stands at Rocky Comfort Flat have very little mountain big sagebrush, as described by these workers, and may be more similar to communities described from Oregon (see description of Unit 2). This mapping unit occurs on deeper soils along the eastern border of the proposed area. The mountain big sagebrush/Idaho fescue association is widespread in southern Idaho as well as the northern portion of the Intermountain area. It is included in many proposed and established RNAs in Idaho. Small inclusions (less than one acre) of the Artemisia rigida/Poa secunda (stiff sagebrush/Sandberg's bluegrass) habitat type also occur in this unit.

Unit 2 Patterned Ground

Known also as Mima mounds or biscuit and swale topography, this interesting topographic feature is well developed in the eastern half of the proposed area and is totally absent from the western half. It occurs on nearly level surfaces. This topographic pattern, with large mounds ("biscuits") of deep, relatively fine-textured soil and intervening "swales" where bedrock is at the surface, is thought to be a periglacial feature remaining from the last Ice Age. Differential frost-sorting of the fine material from the coarse material is thought to be the process by which the pattern develops (see Johnson and Simon 1987, page 41, for an explanation of the phenomenon). It should be noted, however, several other theories have also been put forward (e.g., Cox and Allen 1987).

Whatever its origin, the patterned ground topography should be treated as a single landscape unit for conservation. It is, however, comprised of two distinct community components: the deep-soil biscuits are the mountain big sagebrush/Idaho fescue association, as described in Unit 1, while the intervening swales are scabland sites comprised of the stiff sagebrush/Sandberg's bluegrass association, as described in Unit 3.

As mentioned above, the associations classified here as mountain big sagebrush/Idaho fescue, have very little mountain big sagebrush present. The reason for this is unclear. One explanation could be that fire eliminated sagebrush from some of the mounds and it has been unable to recolonize. Another is that the association at Rocky Comfort Flat is more closely related to bunchgrass communities described from northeastern Oregon. Rocky

Comfort Flat is near the border of both the sagebrush-steppe biome and the Pacific Northwest bunchgrass biome. In fact, populations of mountain big sagebrush in the Seven Devils are the northernmost of any Artemisia tridentata taxon in Idaho. Also, grassland communities of the proposed RNA, in the Crooked River and Bear Creek canyons, are bunchgrass-dominated and lack any sagebrush.

Johnson and Simon (1987) described a Festuca idahoensis/Koeleria cristata (mounds) association from north of the Wallowa Mountains, Oregon, that would precisely fit the stands at Rocky Comfort, if the occasional mountain big sagebrush patches were ignored. Cover and constancy values from their stand table (page 39) are similar to the pRNA stands, including the high constancy of Wyeth's buckwheat (Eriogonum heracleoides). Further evidence of this phytogeographic relationship occurs in the swales. While the community there clearly keys to the stiff sagebrush/Sandberg bluegrass association because of the presence of stiff sagebrush, in places there is high cover of one-spike oatgrass (Danthonia unispicata), a species that is largely absent from the extensive stands of this association on the western half of the pRNA (Unit 3). Interestingly, Johnson and Simon (1987) described a Poa secunda/Danthonia unispicata association from Oregon, that can occur in the swales between mounds.

The patterned ground communities, represented by this map unit, are not common in Idaho, and, to the best of my knowledge, do not occur in another proposed or established RNA in the state. Obviously, more study is needed to elucidate the reasons behind the low cover and spotty nature of mountain big sagebrush distribution in the pRNA. If the phytogeographic relationship described above holds true, the landscape mosaic described here is unique to the state.

Unit 3 Artemisia rigida/Poa secunda (High Elevation) (stiff sagebrush/Sandberg's bluegrass) habitat type

Although originally described from Idaho by Daubenmire (1970) and later by Hironaka *et al.* (1983), Tisdale (1986) has done the most to clarify the ecology of stiff sagebrush communities in the state. Upon visiting Rocky Comfort Flat in the early 1980's, Ed Tisdale realized that the stiff sagebrush/Sandberg's bluegrass habitat type described by Daubenmire (1970), from low elevations in the Columbia Basin, did not adequately encompass the full range of variation in stiff sagebrush communities in Idaho. Based in part on plots from Rocky Comfort Flat pRNA, he described a high elevation variant of Daubenmire's habitat type (Tisdale 1986). Johnson and Simon's (1987) stiff sagebrush/Sandberg's bluegrass association from adjacent parts of Oregon, probably represents this high elevation type.

This is the most widespread unit in the pRNA, being particularly extensive in the western half of the area. As mentioned above, this association also occurs in the swales of Unit 2 and as small inclusions in Unit 1. An interesting variant of the typical stiff sagebrush/Sandberg's bluegrass association represented by this unit is codominated by Idaho fescue, and mapped as Unit 13 (which see).

Extensive stands of the stiff sagebrush habitat type and associated scabland environments are the primary reason that Rocky Comfort Flat was proposed to the Payette NF as a RNA by the Idaho Natural Areas Coordinating Committee in the early 1980's. Indeed, in nearly a decade of inventory and study throughout Idaho, I and others have yet to find an area with the extensive, relatively isolated and undisturbed stands of stiff sagebrush that occur at Rocky Comfort Flat. This is borne out by a recent study by the National Park Service of ecological themes in the Columbia Plateau Natural Region as part of the National Natural Landmark (NNL) program.

Phase I of the NNL study (The Nature Conservancy *et al.* 1989) classified the Columbia Plateau into ecological themes, one of which was the Stiff Sagebrush Steppe Theme. The theme was split into two subthemes, Columbia Basin Stiff Sagebrush Scabland Subtheme and Stiff Sagebrush Parkland Subtheme, to reflect the elevational differences in stiff sagebrush communities described above. Stiff sagebrush stands at Rocky Comfort Flat lie within the latter subtheme.

Phase II of the study evaluated nine sites on the Columbia Plateau for potential NNL designation to represent the Stiff Sagebrush Parkland Subtheme. Rocky Comfort Flat pRNA was chosen as the most representative because of its "diversity and degree of rarity, combined with its accessibility for research and public education" (Crawford *et al.* 1989). During Phase III of the study, a NNL Evaluation was prepared for Rocky Comfort Flat pRNA describing its nationally significant ecological features (Bernatas 1989).

The Forest Service Sensitive Plant Species, pale Wallowa Indian paintbrush (*Castilleja oresbia*), occurs exclusively in the stiff sagebrush/Sandberg's bluegrass habitat type of this unit.

Unit 4 Talus Garland Community Type

Steep canyonsides dominated by bunchgrass communities often contain relatively stable talus ringed by various shrubs. Shrubs persist along the margin because of high moisture storage afforded deep beneath the talus. See Johnson and Simon (1987) for a description of this community and its environment. At Rocky Comfort Flat this community occurs on the south-facing canyon slope above Crooked River and is surrounded by grasslands of Unit

5. The dominant shrubs are serviceberry (Amelanchier alnifolia) and syringa (Philadelphus lewisii), with lesser amounts of white snowberry (Symphoricarpos albus) and bitterbrush (Purshia tridentata).

While not uncommon in the canyons of west-central Idaho, talus garland communities are important landscape features that add considerable diversity to grasslands of the region.

Unit 5 Agropyron spicatum/Poa secunda/Balsamorhiza sagittata
(bluebunch wheatgrass/Sandberg's bluegrass/arrowleaf
balsamroot) habitat type

This association, as described by Tisdale (1986), occurs on the steep, south-facing slopes above Crooked River and lower Bear Creek. The community appeared typical of canyon grassland communities found elsewhere in west-central Idaho, including several proposed and established RNAs. Only the lower slopes, immediately above the road, appear to have been degraded by livestock grazing. The mid- and upper slopes are in excellent ecological condition. Large bitterbrush plants are widely scattered in this unit, but nowhere appear to be dense enough to be considered the bitterbrush/bluebunch wheatgrass community. Scattered outcrops in this unit have the mountain mahogany (Cercocarpus ledifolius)/bluebunch wheatgrass habitat type but are less than one acre in size. Talus garland communities (Unit 4) occur within the grassland matrix of this unit.

Unit 6 Purshia tridentata/Festuca idahoensis (bitterbrush/Idaho
fescue) community type

A small area of this type occurs in a forest opening on a slightly undulating bench in the center of the pRNA. Idaho fescue appears dominant, but bluebunch wheatgrass and junegrass also have high cover. This community type has not been described from Idaho, but appears similar to that described from the Wallowa Mountains by Johnson and Simon (1987). They did not record any junegrass from their sampled stands, however. Rocky Comfort Flat is the only site in Idaho for this type.

Unit 7 Pseudotsuga menziesii/Symphoricarpos albus (Douglas-
fir/white snowberry) habitat type, Pinus ponderosa
(ponderosa pine) phase

This habitat type, described by Steele et al. (1981), comprises a majority of the forest cover on the plateau. It is confined to two swales draining the north side of the plateau and occurs on gentle slopes. Snowberry is the dominant understory shrub, although white spiraea (Spiraea betulifolia) is common. This

habitat type is widely scattered in central and northern Idaho, but occurs in only one other pRNA in central Idaho. The Douglas-fir/ninebark (Physocarpus malvaceus) habitat type occurs in several, very small areas within this unit, generally on the steeper, north-facing slopes.

Field notes from Chuck Wellner indicate that several other forest types have been observed from the plateau, which were not observed during this study. In a visit by Chuck and myself on April 28, 1985, we recorded the ponderosa pine/hawthorn (Crataegus dougalsii) habitat type. I did not see any hawthorn associated with forest stands in the pRNA on this trip. In fact, no stands I consider climax to ponderosa pine were seen in this mapping unit. The southern fringe of the unit contained little to no Douglas-fir, but the band was too narrow to be considered a pine climax type. Wellner also observed the Douglas-fir/mountain snowberry (Symphoricarpos oreophilus), Douglas-fir/pinegrass (Calamagrostis rubescens), and Douglas-fir/heartleaf arnica (Arnica cordifolia) habitat types during a visit with Ed Tisdale in June, 1988. I saw none of these. Mountain snowberry is present, but outside or on the edge of forest stands. Nowhere did it constitute a habitat type. Pinegrass was common in many stands, but they always keyed to Douglas-fir/white snowberry due to the presence of snowberry. The Douglas-fir/heartleaf arnica habitat type described by Steele et al. (1983) is limited only to the east-central part of Idaho.

Unit 8 Pseudotsuga menziesii/Physocarpus malvaceus (Douglas-fir/ninebark) habitat type, Pinus ponderosa (ponderosa pine) phase

This type, described by Steele et al. (1981), is extensive on the steep, northerly-facing walls in the Bear Creek canyon. Wellner, in his field notes from June, 1988, indicated that the Douglas-fir/mountain snowberry habitat type occurred on the north slopes also. I did not see it during this study, but it would be included in this mapping unit if present. Douglas-fir/ninebark is one of the most common forest habitat types in the state and is represented in many established and proposed RNAs.

In places the forest stands are interrupted by rock outcrops containing small areas of the mountain mahogany/Idaho fescue habitat type. The riparian zone along Bear Creek is included in this unit. It is very narrow, and consists of a thin band of shrubs at the edge of the high-water line. *Syringa* is the most common species present.

Unit 9 Cercocarpus ledifolius/Festuca idahoensis (mountain mahogany/Idaho fescue) and /Agropyron spicatum (bluebunch wheatgrass) habitat types

This unit in the Bear Creek canyon has about 50:50 coverage of these two habitat types. The bluebunch wheatgrass type occurs on the southerly aspects, while the Idaho fescue type is more northerly-facing. The mountain mahogany/bluebunch wheatgrass habitat type has been described by Hironaka et al. (1983) and the Idaho fescue type corresponds to a moist phase of Johnson and Simon's (1987) "mountain mahogany plant community type."

Mountain mahogany/bluebunch wheatgrass is a common association in southern and central Idaho, well represented in several proposed and established RNAs. The mountain mahogany/Idaho fescue habitat type is uncommon in the state, although it is included in several proposed and established RNAs.

Unit 10 Cercocarpus ledifolius/Agropyron spicatum (mountain mahogany/bluebunch wheatgrass) habitat types

Extensive stands of this unit occur on the steep, south- and west-facing slopes in the Bear Creek canyon. Basalt outcrops are extensive. Small inclusions of the bluebunch wheatgrass/Sandberg's bluegrass/arrowleaf balsamroot habitat type also occur in this unit. Small stands of Douglas-fir occur in south-facing talus and on northerly-facing slopes. The north-facing stands are the Douglas-fir/ninebark habitat type.

Unit 11 Pinus ponderosa/Symphoricarpos albus (ponderosa pine/white snowberry) habitat type

This small unit has only ponderosa pine in the overstory; no Douglas-fir is present. The understory is comprised of several tall shrubs , such as serviceberry and chokecherry (Prunus virginiana), but no hawthorn was seen. The stand keys to the white snowberry habitat type of Steele et al. (1981), because white snowberry is well represented. This habitat type is common in west-central Idaho and elsewhere.

Unit 12 Festuca idahoensis/Agropyron spicatum (Idaho fescue/bluebunch wheatgrass) habitat type

Two small, north-facing slopes on the rim of the canyon above Bear Creek have a high cover of grasses and forbs. There appeared to be a paucity of junegrass in these stands and, therefore, appeared to key to the Idaho fescue/bluebunch wheatgrass habitat type (Tisdale 1986). This association is common in the canyons of west-central Idaho.

Unit 13 Artemisia rigida/Poa secunda - Festuca idahoensis (stiff sagebrush/Sandberg's bluegrass - Idaho fescue) community

A relatively large stand of stiff sagebrush in the center of the pRNA is similar to the stiff sagebrush/Sandberg's bluegrass habitat type described in Unit 3, except that Idaho fescue has high cover. This is unlike any other stands of stiff sagebrush in the pRNA, which are almost totally devoid of Idaho fescue. This phase is undescribed in the literature, although Wellner mentioned a Idaho fescue phase of the stiff sagebrush/Sandberg's bluegrass in his field notes from a visit to the pRNA with Ed Tisdale in June, 1988. I did not see the bluebunch wheatgrass phase that he also mentioned in those notes.

This interesting variant of the stiff sagebrush habitat type is not known from any other site in Idaho.

Unit 14 Tall shrub drainage bottom

A small depositional basin below a patch of forest on the west side of the plateau is dominated by several tall shrub species. Hawthorn and chokecherry form scattered, nearly monotypic clones, which have white snowberry as the common understory shrub. The interstices are dominated by grasses such as junegrass, Idaho fescue, California brome (Bromus marginatus), and bluebunch wheatgrass. Wyeth's buckwheat is also common in these grassy areas.

Unit 15 Poa secunda/Balsamorhiza hookeri (Sandberg's bluegrass/Hooker's balsamroot) association

This association occurs in shallow depressions within the scabland areas of the site. Stiff sagebrush is absent from these stands. Ed Tisdale (1986) described this type based on plots from Rocky Comfort Flat pRNA. Prior to publication of the canyon vegetation by Tisdale, this type was referred to as the "Lomatium community" because of the aspect-dominance assumed by several biscuitroot species, especially Lomatium leptocarpum. This association is a mass of yellow biscuitroot flowers in late April and early May, the time when original visits to the area were made. Somewhat later in May, biscuitroot flowers begin to decline and Hooker's balsamroot assumes aspect-dominance. Following the decline of balsamroot flowers, Sandberg's bluegrass becomes tall enough to appear to dominate the sites.

The basalt plateaus of the Wildhorse River drainage comprise the total known extent of this unique association in the world.

Unit 16 Ephemeral stream channels

Although no permanent streams are present on the plateau, there are two areas where ephemeral streams run in the spring. They are indicated by black lines on the map. While each is probably less than one acre in size, these two systems constitute an important and unique aspect to the biological diversity to the pRNA.

The channels are fed by water that runs overland off the adjacent basalt plateau. Precipitation "perches" on the basalt bedrock in the spring and runs slowly toward the channels or, more likely, evaporates quickly before reaching the channels. The quantity and timing of flow in these streams is largely dependant on spring precipitation patterns, but they are typically dry before late June.

The ephemeral stream courses are dominated by camas (Camassia quamash), in association with dwarf hesperochiron (Hesperochiron pumilus), shooting-star (Dodecatheon pulchellum), western saxifrage (Saxifraga occidentalis), and pussytoes (Antennaria luzuloides). Three regional endemics also occur in this unique habitat: Cusick's primrose (Primula cusickiana), Blue Mountain buttercup (Ranunculus oresterus), and Tolmie's onion (Allium tolmiei var. persimile). The latter taxon is a Forest Service Sensitive Plant Species in Region 4.

RARE PLANT SPECIES

Two rare plant species, both on the Region 4 Sensitive Species List, are known from the pRNA. Inventories for both species were conducted in May and June 1990. The inventories were Challenge Cost-share projects between the Heritage Program and the Payette NF; reports detailing the results will be prepared soon. Although the habitats of these two species have been alluded to previously, a short summary of their distribution and abundance in the Rocky Comfort Flat pRNA follows. Rare plant distributions were mapped separately from the communities on Map 2.

Pale Wallowa Indian paintbrush (Castilleja oresbia) - This small, yellow-flowered paintbrush is endemic to Adams County, Idaho, and adjacent Oregon. In Idaho, it is restricted to high-elevation stiff sagebrush scablands. At Rocky Comfort Flat, approximately 1,500 plants are widely scattered in all stiff sagebrush habitats of Unit 3.

Tolmie's onion (Allium tolmiei var. persimile) - This taxon is endemic to Adams County, Idaho, where it is locally abundant in suitable habitat. On the pRNA, however, there is only a small population of several hundred plants occurring in the camas community along the eastern ephemeral stream (eastern portion of Unit 16).

RARE ANIMAL SPECIES

No rare animal populations are known from the pRNA. Surveys have been conducted in the pRNA for the Idaho ground squirrel (Spermophilus brunneus), but none were found on the area.

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