

Baseline and stewardship monitoring on Sawtooth National Forest Research Natural Areas

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Introduction

Research natural areas are part of a national network of ecological areas designated in perpetuity for research and education and to maintain biological diversity on National Forest System lands. Seven research natural areas occur on Sawtooth National Forest: Basin Gulch, Mount Harrison, Pole Canyon, Pole Creek Exclosure, Redfish Lake Moraine, Sawtooth Valley Peatlands, and Trapper Creek (Figure 1). These natural areas were established in the late 1980s and mid 1990s to provide representation of a diverse range of biological and physical components, ranging from cool, montane peatlands to dry, sagebrush steppe and juniper woodlands. Stewardship monitoring is needed within the research natural areas to assure attainment of long-term management goals for these specially designated ecological reference areas. An opportunity exists, as well, to capitalize the value of these sites to provide baseline reference data for monitoring and evaluating more intensively managed lands. The objectives of this study are to: (1) conduct basic stewardship monitoring within the seven established research natural areas on Sawtooth National Forest and (2) establish baseline monitoring within selected research natural areas.

Study Area

Seven research natural areas occur on Sawtooth National Forest. Three - Pole Creek Exclosure, Redfish Lake Moraine, and Sawtooth Valley Peatlands - are located in the Sawtooth Valley region; one - Basin Gulch - is located in the vicinity of Trail Creek Pass, east of Ketchum, Idaho; and three - Trapper Creek, Mount Harrison, and Pole Canyon - are dispersed across the southern portion of the Forest within the South Hills, Albion Mountains, and Black Pine Mountains (respectively). The locations of Sawtooth National Forest research natural areas is shown in Figure 1.

Information on the biological values, management, and how to access the research natural areas is located in the establishment record for each respective site (Mancuso and Evenden 1996; Moseley and Evenden 1996; Rust and Evenden 1996a, b, c, d; Wellner and Moseley 1988). Idaho Conservation Data Center also maintains information on each site in an electronic database (Idaho Conservation Data Center 2003a and 2003b) and in paper files. The following site descriptions are taken from Idaho Conservation Data Center (2003b).

BASIN GULCH - Basin Gulch is a small, complete watershed containing two cirques and a steep gradient stream with many cascades and waterfalls (Figure 2). Elevations range from 6,650 feet (2027 m) at Trail Creek in the southeastern corner of the RNA to 10,458 feet (3188 m) on the highest summit at the head of Basin Gulch. Ancient, large diameter trees are present within *Pinus albicaulis* and *Pinus flexilis* stands. The highest peak in the area supports subalpine vegetation and some alpine species. The area also contains three *Abies lasiocarpa* habitat types, extensive areas of scree vegetation, scree meadows, and areas with *Artemisia tridentata vaseyana* habitat types. Also of interest is the extensive coverage of a dwarfed (<10' tall) *Abies lasiocarpa* forest, maintained by large, frequent avalanches.

Plant associations present within the area include: *Abies lasiocarpa*/*Arnica cordifolia*, *Abies lasiocarpa*/*Carex geyeri*, *Abies lasiocarpa*/*Ribes montigenum*, *Pseudotsuga menziesii*/*Juniperus communis*, *Artemisia tridentata vaseyana*/*Agropyron spicatum*, *Artemisia tridentata vaseyana*/*Festuca idahoensis*, and *Pinus albicaulis*/*Poa nervosa*.

REDFISH LAKE MORAINE - Redfish Lake Moraine RNA encompasses a section of a large lateral moraine located on the east side of Redfish Lake (Figure 3). Three different ages of glacial deposition are present. The youngest covers the steep inner slope of the moraine. Two older deposits cover the relatively gentle outer slope. Elevations range from 6,547 feet (1984 m) along the western boundary on the shore of Redfish Lake to 7,520 feet (2279 m) on the ridgeline above the lake. Much of the vegetation within the natural area is dominated by *Pinus contorta* in various seral stages of *Pseudotsuga menziesii*, or *Abies lasiocarpa* habitat types.

On gentle benches of the outer slope of the moraine, *Pinus contorta* occurs in near climax conditions. In these stands the older *Pinus contorta* age class is being replaced by a younger age class. It is difficult to determine if these stands are *Pseudotsuga menziesii* or *Abies lasiocarpa* climax. Several communities are restricted to a narrow zone along Redfish Lake shoreline. These communities are affected either by cold air drainage or a high water table. The *Abies lasiocarpa/Vaccinium scoparium* habitat type falls in the former category, while several communities fall into the latter, including *Abies lasiocarpa/Menziesia ferruginea*, *Abies lasiocarpa/Ledum glandulosum*, and *Alnus sinuata* plant associations. A lake shore plant community that occurs below mean high water line of the lake is also present.

Plant associations present within the natural area include: *Pinus contorta/Carex geyeri*; *Abies lasiocarpa/Calamagrostis rubescens*; *Abies lasiocarpa/Carex geyeri*; *Abies lasiocarpa/Calamagrostis canadensis*, *Ledum glandulosum* phase; *Pseudotsuga menziesii/Calamagrostis rubescens*; *Pseudotsuga menziesii/Vaccinium caespitosum*; *Alnus sinuata*; *Abies lasiocarpa/Calamagrostis canadensis*, *Vaccinium caespitosum* phase; *Abies lasiocarpa/Menziesia ferruginea*, *Menziesia ferruginea* phase; *Abies lasiocarpa/Vaccinium scoparium*, *Calamagrostis rubescens* phase; and *Pseudotsuga menziesii/Carex geyeri*, *Carex geyeri* phase.

Redfish Lake is the spawning site for the endangered *Oncorhynchus nerka* (sockeye salmon), and it supports *Salvelinus confluentus* (bull trout), a candidate for listing. In 1993, a *Falco peregrinus* (peregrine falcon) pair was documented nesting on cliffs west of the lake. The raptors could potentially use the RNA for foraging or other activities.

MOUNT HARRISON - Mount Harrison is the highest peak in the Albion Range of southern Idaho. The area includes subalpine habitats on the eastern slopes of Mount Harrison consisting of gently-sloping meadows and a small basin. Elevations range from 8,400 feet (2560 m) along the eastern boundary to 9,240 feet (2816 m) near the summit of Mount Harrison (Figure 4). The basin is a rocky, steep-walled cirque with a pool at the bottom. The pool is vernal in dry years, but contains water in wet years. Mountain shrub-steppe vegetation lies east of the pool. Most of the area is cliff, boulder, and scree slopes. The north rim supports tundra-like vegetation containing a number of alpine species.

The steep topography and distribution of geologic substrates in the area result in some very distinct vegetation patterns. For example, both *Pinus flexilis* and *Abies lasiocarpa* occur on south slopes in the area. The *Pinus flexilis* is restricted to calcareous substrates, while *Abies lasiocarpa* occurs on quartzite. Plant associations present within the area include: *Abies lasiocarpa/Ribes montigenum*, *Pinus flexilis/Cercocarpus ledifolius*, *Artemisia tridentata vaseyana-Symphoricarpos oreophilus/Bromus carinatus*, *Artemisia arbuscula arbuscula/Agropyron spicatum*, *Artemisia tridentata vaseyana/Festuca idahoensis*, and *Carex elynoides* turf.

Mount Harrison RNA supports four special status plant species that are narrowly distributed in Idaho: *Castilleja christii*, *Cymopterus davisii*, and *Machaeranthera laetevirens*. *Castilleja christii* is endemic to Mount Harrison and in 2002 was given a G1/S1 ranking. *Cymopterus davisii* is endemic to the Albion Range and is known from only two other sites. *Machaeranthera laetevirens* is known from only three other sites in Idaho and Nevada. Mount Harrison RNA is the only documented occurrence for *Machaeranthera shastensis* var. *latifolia* in Idaho. The site also supports a diversity of plant communities that are not usually found at these high elevations. The occurrence of *Cercocarpus ledifolius* in the *Pinus flexilis/Cercocarpus ledifolius* habitat type is unusual, and a number of species that normally occur at alpine elevations are found on the windswept rim of the cirque headwall.

TRAPPER CREEK - Trapper Creek RNA encompasses a mesa on the eastern slope of the South Hills. The mesa dips gently from west to east. Short basalt cliffs ring most of the mesa, lying in sharp contrast to the sedimentary tuff deposits of the surrounding area. Elevations range from 5,920 feet (1794 m) to 6,400 feet (1939 m) (Figure 5). The vegetation is comprised largely of *Juniperus osteosperma* plant associations. Stands of *Artemisia arbuscula* habitat types are interspersed within the *Juniperus osteosperma* woodlands with more shallow soils. In some areas, *Artemisia arbuscula* co-occurs with

Artemisia nova. A few small stands of pure *Artemisia nova* are also present. Deeper soils, found in the center of the area, are currently dominated by *Chrysothamnus nauseosus*, *Artemisia tridentata vaseyana* or *Artemisia tridentata wyomingensis*, as well as a lush mixture of grasses including *Festuca idahoensis*, *Agropyron spicatum*, and *Elymus cinereus*. Most of this area was previously burned and numerous skeletons of *Juniperus osteosperma* are present.

Plant associations present with Trapper Creek RNA include: *Artemisia arbuscula arbuscula/Poa secunda*, *Artemisia nova/Poa secunda*, *Artemisia arbuscula thermopola/Festuca idahoensis*, *Juniperus osteosperma/Festuca idahoensis*, *Juniperus osteosperma/Artemisia arbuscula arbuscula/Festuca idahoensis*, and *Juniperus osteosperma/Artemisia tridentata vaseyana/Festuca idahoensis*.

POLE CREEK ENCLOSURE - Pole Creek Enclosure RNA occurs in the center of the wide valley bottom of Pole Creek, located on the east side of Sawtooth Valley (Figure 6). Pole Creek has cut a shallow, relatively wide flood plain through undulating, well-drained glacial deposits. Elevations in the area vary little from 7,320 feet (2218 m) to 7,360 feet (2230 m). Vegetation is comprised of *Artemisia tridentata vaseyana* habitat types on dry upland sites, *Abies lasiocarpa* habitat types on mesic upland sites, and *Pinus contorta*, *Salix* spp., and *Carex* spp. community types on saturated substrates along Pole Creek.

Plant associations present within the natural area include: *Abies lasiocarpa/Calamagrostis rubescens*, *Artemisia tridentata vaseyana/Agropyron spicatum*, *Salix boothii/Carex utriculata*, *Salix wolfii/Carex utriculata*, *Artemisia tridentata vaseyana/Festuca idahoensis*, *Carex utriculata*, and *Potentilla fruticosa/Danthonia intermedia*.

POLE CANYON - Pole Canyon RNA lies at the headwaters of Mill Fork, a tributary of Pole Canyon located on the east slope of the Black Pine Mountains of southeastern Idaho (Figure 7). The area encompasses two small east-facing drainages. Elevations in the RNA range from 6,600 feet (2000 m) where Mill Fork leaves the area to 8,376 feet (2538 m) on the peak at the southwest corner. The vegetation is comprised of coniferous forest habitat types in the *Pseudotsuga menziesii* and *Abies lasiocarpa* series, two *Populus tremuloides* community types, and non-forest associations that fall into three climax sagebrush series. *Pediocactus simpsonii* var. *robustior*, a plant species of concern, occurs within the area.

Plant associations present within the natural area include: *Abies lasiocarpa/Carex geyeri*, *Abies lasiocarpa/Berberis repens*, *Abies lasiocarpa/Osmorhiza chilensis*, *Abies lasiocarpa/Thalictrum occidentale*, *Pseudotsuga menziesii/Acer glabrum*, *Pseudotsuga menziesii/Osmorhiza chilensis*, *Populus tremuloides/Amelanchier alnifolia-Symphoricarpos oreophilus/Calamagrostis rubescens*, *Artemisia tridentata vaseyana/Bromus carinatus*, *Artemisia tridentata vaseyana/Leucopoa kingii*, *Artemisia tridentata vaseyana/Agropyron spicatum*, *Artemisia tridentata vaseyana-Symphoricarpos oreophilus/Agropyron spicatum*, *Artemisia nova/Agropyron spicatum*, *Pseudotsuga menziesii/Berberis repens*, *Carex geyeri* phase, *Artemisia tridentata spiciformis/Carex geyeri*, and *Artemisia frigida/Agropyron spicatum*.

SAWTOOTH VALLEY PEATLANDS - Sawtooth Valley Peatlands is comprised of three separate peatland sites that lie at the east base of the Sawtooth Range in the Sawtooth Valley of central Idaho (Figure 8). The three peatlands - Bull Moose Fen, Huckleberry Creek Fen, and Mays Creek Fen - are relatively small, ranging in size from 34 to 80 ha and lie in close proximity to one another at the western edge of the valley. They are similar in that the organic substrates are greater than 12 inches thick, yet each is different from the others, and together they encompass much of the range of diversity of peatland habitats in the Sawtooth Valley. All three fens have high community diversity and a mosaic of plant associations.

Bull Moose Fen is a sloped wetland located between the moraines of Decker and Red Fish Lake creeks. The wetland occurs in an area that is sub-irrigated by groundwater which originates as precipitation on porous glacial till upslope. The *Pinus contorta/Vaccinium occidentale* plant association is present throughout the fen. Standing dead *Pinus contorta* are common. The association occurs with considerable variation in the understory species composition. *Vaccinium occidentale* is constant although other shrubs such as *Betula glandulosa* (bog birch), *Pentaphylloides floribunda* (shrubby cinquefoil), *Salix wolfii* (Wolf's

willow), or *Salix planifolia* (planeleaf willow) or graminoids including *Deschampsia cespitosa* (tufted hairgrass), *Carex utriculata* (bladder sedge), or *Calamagrostis canadensis* may be locally dominant. The southern arm of the fen has a high gradient (greater than a 5 percent) slope. This area includes a peat terrace that is 20 to 30 feet higher than the adjacent fen and contains the source of spring-fed rivulets that cascade down the face. The southern arm of the site is more diverse and includes somewhat continuous stands of *Eleocharis pauciflora* with lesser amounts of *Scirpus cespitosus*. *Carex utriculata* also creates large stands, but close inspection of most stands reveals high cover of *Salix wolfii*, *Salix planifolia*, and *Betula glandulosa*. Small patches of *Carex simulata* and *Deschampsia cespitosa* are also present but considered inclusions within other plant associations. A small area of open water in an ancient beaver dam is present and its outlet supports a small stand of *Salix geyeriana/Calamagrostis canadensis*. The northern arm of the fen also contains small patches of *Salix geyeriana*; but for the most part, it is dominated by *Pinus contorta/Vaccinium occidentale*.

Bull Moose Fen is a largely undisturbed high quality peatland complex. The spring creeks are important rearing areas for steelhead and chinook salmon, and, in most years, provide a continual source of cool water throughout the growing season.

Huckleberry Creek Fen is a sloped, sub-irrigated wetland that occurs between the moraines of Hell Roaring and Decker creeks. The fen is a very complex mosaic of plant associations that extend over short distances. The most widespread association is *Pinus contorta/Vaccinium occidentale*. Small microsites (up to 10 x 10 m) support near mono-cultures of *Carex utriculata*, *Eleocharis pauciflora*, *Carex livida*, *Scirpus cespitosus*, and *Betula glandulosa*. These small stands occur as inclusions within the dominant *Pinus contorta/Vaccinium occidentale*.

Huckleberry Creek originates above the peatland and transverses the area. The stream is a spring creek; flows are not driven by melt of high elevation snow pack. The fen provides habitat for several peatland species of concern including *Carex livida*, *Carex buxbaumii*, and *Drosera intermedia*. Spring creeks within the site are important rearing areas for steelhead and chinook salmon. These streams provide a continual source of cool water throughout the growing season in most years.

Mays Creek Fen is located between the moraines of Yellow Belly Lake and Hell Roaring Creek. The site encompasses sub-irrigated, sloped wetlands associated with springs and the low gradient channel of Mays Creek. The fen includes tall *Salix geyeriana*-dominated wetlands as Mays Creek enters the flat valley bottom. Semi-permanently, saturated mid-slopes of the wetland support a mosaic of *Scirpus cespitosus*, *Eleocharis pauciflora*, *Carex utriculata*, *Salix planifolia*, and islands of the *Pinus contorta/Vaccinium occidentale* plant association. At the lower end of the wetland (near the eastern boundary of the RNA), Mays Creek enters a well-defined channel through well-drained wetlands dominated by *Salix wolfii* and *Deschampsia cespitosa*. Just outside this boundary, stands of *Artemisia cana* are present.

Mays Creek provides important rearing habitat for chinook and steelhead salmon. The spring creeks provide a continual source of cool water throughout the growing season. The fen provides habitat for three plant species of concern, including one of the known populations of the USDA Forest Service Sensitive species *Drosera intermedia*.

Methods

Information on each of the seven natural areas regarding the plant associations and rare plant populations present, previously identified stewardship issues, past and ongoing monitoring activities, and information needs was reviewed prior to conducting field visits. An initial list of potential monitoring activities was developed. The sites were visited August through September 2002.

Stewardship monitoring and site survey protocols (Bourgeron 1992; Evenden 1995) were employed during

visits to the natural areas. Standard ecology field methods (Bourgeron et al. 1992; USDA Forest Service 1992) were used to collect and record new plant community inventory data. Data were collected using both fixed area and stand level methods. Permanent long-term monitoring plots were established following guidelines of Elzinga et al. (1998) and USDI Bureau of Land Management (1996) (detail descriptions of monitoring procedures are provided in Appendix A). Permanent monitoring plots were established both for purposes related to (1) site-specific stewardship objectives and (2) baseline monitoring related to landscape-scale management concerns or biological phenomena. The locations of inventory and monitoring plots were recorded in the field using navigation grade geographical positioning system (GPS) units (e.g., Garmin 12XL) and by hand on 1:24,000 USGS quadrangles.

Results

The results of stewardship and baseline monitoring are discussed in the following text on a site-by-site basis. For each site the discussion is organized into sub-sections titled: stewardship monitoring summary, baseline monitoring and inventory results, and monitoring needs and opportunities.

Evenden (1995) outlines a stewardship monitoring protocol. The objectives of the protocol are to (1) document current uses of research natural areas, (2) identify and document current or anticipated threats to the integrity of research natural areas, and (3) identify management and monitoring needs. The intent of the monitoring protocol is that field observations would be stored and summarized through the use of the Biological and Conservation Database (BCD) System developed by The Nature Conservancy (1996) and Natural Heritage Programs nationwide (e.g., Idaho Conservation Data Center maintains BCD records for all USDA Forest Service research natural areas within Idaho).

Linkages between the stewardship monitoring protocol and BCD, however, are not always clear. That is, for example, there is no correspondence between some of the fields identified in the protocol and a comparable field in BCD. A compounding factor is that BCD is based in outdated software technology. Natural Heritage Programs across the nation are currently migrating to an updated Heritage data management system (HDMS-Biotics) for maintaining information on rare species occurrences, plant community element occurrences, and conservation sites and natural areas (such as USDA Forest Service research natural areas). The stewardship monitoring protocol (Evenden 1995) was employed here in concept. Results from stewardship monitoring visits are below. Updated site basic records (Idaho Conservation Data Center 2003b), which reflect the stewardship monitoring visits, are provided for each site in Appendix B. Update plant species lists for each site are provided in Appendix C.

BASIN GULCH

Stewardship monitoring summary: We conducted a stewardship monitoring survey at the site on October 15, 2002. The site receives little recreational use due to difficulty of access. Forest Service Trail 124 crosses through the research natural area (Figure 2). There is little evidence of recreation use within the area. The trail shows minimal trail impact and narrows as it proceeds up the canyon from the stream crossing. There is no evidence of social trail development.

The area is currently not signed. Signs on Trail 124 at the research natural area boundary could help prevent potential impacts of recreational use. Signage should meet visual objectives consistent with the highly aesthetic setting of the research natural area.

We observed *Taraxacum officinale* (common dandelion) within the area.

Baseline monitoring and inventory results: Species composition and environmental data were collected in one stand located in the southern portion of the upper scree slope of the basin. The stand is tentatively classified as *Ribes montigenum/Haplopappus suffruticosus*. This is a species assemblage that is not documented elsewhere. An updated plant species list for the site was compiled (Appendix C).

Monitoring needs and opportunities: Considerable potential for recreational impacts associated with development of social trails, fire rings, and campsites occur within the area, especially in the vicinity of the stream crossing by Trail 124 due to the availability of level ground and adjacent water. Impacts of recreational use within the research natural area at this and other similar sites along Trail 124, as well as the trail itself, could be monitored using methods described by Cole (1989 and 1991). The objective of this monitoring regime should be to detect significant change in user impact prior to significant alteration of research natural area values.

Plant community composition inventory is needed in the glacial cirque basin within the area. Permanent baseline monitoring plots could be established in *Pinus albicaulis* and *Pinus flexilis* stands within the area. The objective of this monitoring activity should be to establish long-term baseline information on the stand dynamics of these plant associations in a pristine setting.

REDFISH LAKE MORAINE

Stewardship monitoring summary: The site is immediately adjacent areas managed to provide (1) dispersed and developed recreation activities in areas conveniently accessed by automobile and other recreational vehicles and (2) timber resources. A large improved campground, with paved access, is in close proximity of the natural area's northern boundary. Two designated system trails pass through the research natural area. Forest Service Trail 045 passes through the natural area on the crest of the glacial moraine. Decker Flat Trail (# 400) joins Trail 045 from the east within the site. The Elk Meadow Way also intersects with Trail 045 and traverses a portion of the natural area. Timber harvest activities have occurred adjacent the natural area in the vicinity of Elk Meadow (Figure 3).

We conducted stewardship monitoring in the site on August 29 and 30, and September 26, 2002. We accessed the research natural area via Forest Service Trail 045, a social trail that runs along the shoreline of Redfish Lake (on the western boundary of the natural area), and Elk Meadow Way trail off jeep trails located in the vicinity of Elk Meadow (on the eastern boundary). The primary objective of the stewardship monitoring activity was to evaluate reported concerns regarding recreational use and adjacent timber harvest activities.

We surveyed the length of the Decker Flat (# 400) and 045 trails within the natural area. Trail 045 appears to be heavily traveled and has a well established tread. The tread is relatively broad and deeply incised at some locations. Mountain bike traffic increases at the intersection with Decker Flat trail and southwestward along the moraine crest. The intersection of the two trails is broad and some tread erosion is occurring. A faint social trail is present off to the northwest of Trail 045 as the trail gains the ridgecrest (west of the intersection with Decker Flat trail). This is the location where north- to southwestward views are first accessible off the trail. Impacts are currently minimal and consist of vegetation trampling, soil displacement, and litter.

Elk Meadow Way trail appears to receive little use. This tread is un-developed and (thus) poses potentially high risk of impacts due to soil erosion. No off-trail use or evidence of camping was noted on the moraine ridgecrest or in the vicinity of Decker Flat Trail.

A well established social trail is present in the northwestern corner of the research natural area. The social trail emulates out of Heyburn Campground, enters the research natural area in the northwest, and traverses along the western boundary, immediately adjacent the lake. We surveyed a portion of the social trail. The tread is relatively narrow, though rather deeply incised in places. The tread is severely braided in several moist places and at stream crossings. We noted one fire ring within the natural area. The ring appeared to be relatively old and was used on only one occasion.

Timber harvest activity and associated road development is present on the eastern boundary of the research natural area. We determined that harvest activity has occurred within the research natural area

in the vicinity of Elk Meadow. This activity occurred before the area was formally established (but probably after the area was proposed for establishment in the Forest Plan). Numerous jeep trails wind throughout the level, open forest and parkland in the vicinity of Elk Meadow. The area is heavily used for pole and firewood cutting.

The eastern boundary of the research natural area should be officially posted to discourage access to the site for off-road vehicle use and pole and firewood cutting.

Baseline monitoring and inventory results: Mortality in *Pinus contorta* and *Pseudotsuga menziesii* due to combined effects of drought and mountain pine beetle (*Dendroctonus ponderosae*) infestation is widespread on the lower slopes of Sawtooth Valley. Treatment of these stands to reduce fuels is a growing interest within the valley (Sawtooth National Recreation Area 2003). We established permanent monitoring plots in similar stands within the natural area (Figure 3). The monitoring objective is to provide baseline information on the structural dynamics of these stands in the absence of mechanical treatments. Two sets of three plots were established (Appendix A; Forest Stand Structure). One set of plots is located in a stand dominated by giant *Pseudotsuga menziesii*; the other set is dominated by large *Pseudotsuga menziesii*.

Monitoring needs and opportunities: Potential for recreational impacts associated with use of system trails within the natural area and development and use of social trails, fire rings, and campsites occur within the area, especially along the shoreline of Redfish Lake. Impacts of recreational use within the research natural area along the shoreline and on system trails could be monitored using methods described by Cole (1989 and 1991). The objectives of this monitoring regime should be to (1) develop a baseline inventory of current recreational use (based on physical attributes, for example, as identified by Cole (1989 and 1991)), (2) develop a plan regarding acceptable level of recreational use (and associated impacts), and (3) monitor attainment of goals identified in the plan.

Additional plots should be established to monitor stand structural dynamics.

MOUNT HARRISON

Stewardship monitoring summary: Mount Harrison is a popular destination for a wide range of uses. Lands adjacent and north of the research natural area site are managed to provide recreational opportunities that are conveniently accessible by automobile or other recreational vehicles (Figure 4). Several developed recreational facilities are located in the vicinity. A paved road travels the north and northwest boundary of the area to a fire lookout and developed interpretive site. Common recreational activities in the area include hiking, biking, botanizing, hang-gliding, and recreational vehicle use. Lands adjacent the natural area south to southeast are grazed by livestock.

We conducted a stewardship monitoring visit in the natural area on September 12 and 13, and October 17, 2002. Prior to our visit management concerns had been raised regarding the natural area including: (1) use of the site by livestock, (2) use of the area by off-road vehicles, (3) impacts of recreational foot traffic, and (4) encroachment of exotic species. The objective of our visit was to assess livestock and off-road vehicle use and to establish permanent monitoring plots that will allow assessment of recreational foot traffic within the area. We accessed the site from Forest Service Road 549.

Extensive improvements have been made in recent years to manage vehicle access on Mount Harrison. We did not observe evidence of off-road vehicle use within the natural area. Recent livestock fence improvements were evident on the eastern boundary of the area. Livestock trailing was evident in the cirque basin on the southern portion of the site. No recent (2002 grazing season) evidence of livestock use was observed in the research natural area. Evidence of past year livestock use was observed. Due to allotment management practices, the 2002 grazing season presented minimal grazing pressure within the research natural area. Cattle were adjacent the area during late summer and fall when no water is

available within the natural area (especially in dry years). In alternate years, potential for livestock use of the area is much higher as cattle are adjacent the site in spring and early summer when water is available within the natural area.

We observed evidence of recreational use extending eastward down the central ridgecrest from the interpretive trail located on the western boundary of the research natural area (just east of the fire lookout). Off-trail foot traffic in this location is resulting in vegetation trampling and displacement of boulders and stones (the rocks are likely thrown off the cirque head wall). Displacement of stones in this fragile alpine turf vegetation results in cascading vegetation loss as plants are exposed to increased wind erosion, increased soil frost heaving, and increased desiccation. Faint social trails were observed on the ridgecrest.

We establish a monitoring plot near the western boundary of the natural area on the ridgecrest (Figure 4) (see Appendix A; Species Composition). The plot is located in vegetation classified as *Carex elynoides* turf. The objective of this monitoring regime should be to detect significant change in user impacts prior to significant alteration of research natural area values. These data will also contribute to baseline information on the relatively poorly known plant association.

Initial monitoring results are summarized in Table 1. The monitoring strategy will allow detection of 30 to 40 percent change (given $\alpha = 10$ percent and $\beta = 10$ percent) in the abundance of soil, gravel, rock, *Sedum lanceolata*, *Carex elynoides*, and *Phlox pulvinata*.

Moseley (1996) established a monitoring program for *Castilleja christii* in 1995. Monitoring the plant population and its habitat was one action identified in a conservation agreement between Sawtooth National Forest and US Fish and Wildlife Service. Twenty population monitoring transects were established and have been re-sampled in 1996, 1997, 2000, and 2002 (Moseley 1997; Moseley 1998; Mancuso 2001; Mancuso 2003). Nine of the transects occur within the research natural area (numbers 4, 5, 10, 11, 12, 13, 14, 15, and 20). The monitoring program also includes (1) a vegetation monitoring transect located along a buried electronic line which passes through the research natural area and (2) species composition plots to monitor *Castilleja christii* habitat.

Baseline monitoring and inventory results: Inventory work was conducted in areas adjacent the research natural area to assess the value of these areas for inclusion within the area or alternatively, establishment of a special interest botanical area adjacent to the research natural area. A key element of high biological significance within the area to be evaluated is the population of *Castilleja christii*. The extent and importance of this plant is discussed by Moseley (1993). Our focus was to evaluate the plant associations within the area for their potential value in contributing to the regional network of ecological reference areas.

Expansion of the research natural area to include areas west, northwest, and north of Mount Harrison (Figure 4) would enhance representation of plant associations currently present within the natural area, primarily *Abies lasiocarpa/Ribes montigenum*, *Artemisia tridentata vaseyana/Festuca idahoensis*, and the Tall Forb community. The proposed expansion would add representation of the Tall Forb community on southwest- and northwest-facing aspects (current representation of the community is only on north-facing aspects) and greatly enhance the total area of representation of the community. The proposed expansion would also add representation of *Agropyron trachycaulum*- and *Festuca idahoensis*-dominated grassland communities present within the area of evaluation. A primary concern regarding expansion of the research natural area is the nature and extent of conflicting uses within the area. In balancing the presence of conflicting uses, consideration should be given to the biological and physical elements represented within the site and potential alternative research natural area locations where these elements might be captured (Forest Service Manual 4063.2). Are alternative sites present within the Albion Mountains to provide representation of extensive Tall Forb communities or the *Agropyron trachycaulum*- and *Festuca idahoensis*-dominated grassland communities present at Mount Harrison? It is likely that alternative sites to provide representation of these communities are not present within the Albion

Mountains region. A definitive search for an alternative location, however, has not been conducted.

Special Interest Botanical Area designation is an alternative to expansion of Mount Harrison RNA. While less encumbered by policy direction to avoid conflicting uses, the Special Interest Botanical Area designation could provide ample protection for the rare plant and plant community resources present at the site - given appropriate management guidelines are established and maintained for the site. Management of the site should take an adaptive approach in which monitoring responsive to the unique ecological and floristic resources of the site are an integral, forefront component.

Monitoring needs and opportunities: Recreational and livestock use of the research natural area should be monitored regularly during the summer season using stewardship monitoring protocols. Livestock trailing within the cirque basin on the southern portion of the natural area should be monitored using the methods developed by Cole (1991).

Replicate monitoring plots within *Carex elynoides* turf vegetation should be established on the ridgecrest east of the plot established in 2002 and at a greater distance from the interpretive and parking facilities located at the lookout tower. Development of social trails on the ridgecrest should be monitored using methods developed by Cole (1991).

TRAPPER CREEK

Stewardship monitoring summary: Trapper Creek RNA is located within an area managed for general timber and range production. The site was first identified as a potential research natural area in the mid-1980s. At that time there was little evidence of livestock use in the area. In the years since, livestock use of the area has increased, perhaps due to the development of a water source immediately adjacent the research natural area. In recent years concerns have arisen regarding livestock use, off-road vehicle use, and artifact collecting activities within the natural area. We conducted a stewardship monitoring survey within the site on September 11, 2002. The objective of the monitoring visit was to evaluate the nature and extent of these uses.

We accessed the research natural area from the west. Livestock did not appear to have entered the natural area in 2002. We observed widespread evidence of use in previous years. On the northwest end of the site, livestock are entering through a moderately sloped break in the mesa wall (Figure 5). In previous years livestock have grazed the site and loafed for prolonged periods locally within the *Juniperus osteosperma* woodland. Livestock use has contributed to soil disturbance, loss of native groundcover, and disturbance to cryptogamic soil crusts. We did not visit the east end of the natural area where similar problems have been reported.

Management objectives for the site to serve as an ecological reference area cannot be achieved if livestock have access to, and utilize, the area. Livestock access to the area should be removed. Construction of drift fencing across areas that allow livestock access has been recommended as one solution to the problem. Management of water available to the cattle in areas adjacent the research natural area and direct herding of livestock may also serve to eliminate livestock use of the area. Allotment management plans and permits should be reviewed to assure that protection of research natural area values and closure of the research natural area to livestock grazing is clearly specified.

Baseline monitoring and inventory results: There is considerable interest in the relationships between *Juniperus osteosperma* abundance, woodland stand structure, and associated understory species composition and abundance. There are few reference data, however, on which to base comparative assessments regarding the influence of livestock grazing or fire disturbance. We established one baseline monitoring plot within a stand classified as *Juniperis osteosperma/Artemisia arbuscula/Festuca idahoensis* (see Appendix A; Species Composition and Juniper Woodland Stand Structure). The objective of the monitoring regime is to provide baseline data on species composition, stand structural dynamics,

and the relationship between these ecosystem attributes.

Monitoring needs and opportunities: Livestock use of the area should be monitoring regularly throughout the grazing season. Additional stand and composition monitoring plots should be established within the natural area.

POLE CREEK EXCLOSURE

Stewardship monitoring summary: Pole Creek Exclosure RNA is located within an area of lands managed for scenic travel and to provide a variety of dispersed and developed recreation activities in semi-primitive non-motorized, semi-primitive motorized, and roaded natural recreation settings. The historic Pole Creek Guard Station is immediately adjacent the natural area. Facilities associated with the historic building are footpaths, a bridge, restroom facilities, interpretive signs, and developed parking area. Concerns about livestock use and inappropriate recreational use of the area have been raised during recent years. We conducted a stewardship monitoring visit within the site on August 28 and September 27, 2002. The objective of the monitoring visit was to evaluate the nature and extent of inappropriate use of the area.

We accessed the research natural area via the Pole Creek Guard Station interpretive site. A number of exotic plant species were observed within the interpretive area: *Bromus inermis*, *Linaria genistifolia* ssp. *dalmatica*, and *Verbascum thapsus*. The presence of these species immediately adjacent the research natural area raised concern that they will potentially become established in the natural area.

No evidence of recent livestock use within the research natural area was observed. We observed evidence that a vehicle (likely a full-sized pick-up truck) had driven off-road within the natural area. The vehicle had accessed the site via the gate located on the northern boundary of the site. Little evidence of inappropriate recreational use of the site was observed.

The entire perimeter of the natural area should be fenced to prevent livestock from entering the area and to discourage recreational use of the area. Fence repairs are needed on the western boundary of the area, on the northern shore of Pole Creek (directly west of the patrol cabin). From the west, a perimeter log fence has been built to the southeast corner of the site; then stops. A wire fence looks like it should continue but has not yet been completed. The gate located on the northern boundary of the area should be locked to discourage off-road vehicle use in the area.

Baseline monitoring and inventory results: We established a baseline permanent monitoring plot in a stand of *Artemisia tridentata vaseyana*/*Festuca idahoensis* located in the northwest portion of the natural area (Figure 6). The objective of the monitoring plot is to establish baseline species composition data for these relatively high elevation stands of sagebrush-steppe vegetation. The methods employed at this site are described in Appendix A (see Species Composition sub-section). Initial monitoring results are summarized in Table 4.

Monitoring needs and opportunities: Frequent stewardship monitoring should occur at the natural area. Additional baseline monitoring plots should be established within the area.

POLE CANYON

Stewardship monitoring summary: Pole Canyon RNA is within an area of the Forest managed with a scenic travel emphasis. Adjacent management activities include timber harvest, fire wood cutting, and livestock grazing. The site is accessed easily by road. Sheep are routinely trailed across the upper ridgelines of the site. Recent concerns have been raised regarding the occurrence of wood cutting, off-road vehicle use, and livestock grazing within the research natural area. We conducted a stewardship monitoring visit to the site on October 10 and 11, 2002. The objective of the monitoring visit was to

evaluate the nature and extent of these uses within the natural area.

We observed relatively recent wood cutting activity within the research natural area. Informational signs that had been placed on the northern boundary of the area, in upper Mill Fork, had been vandalized. A vehicle tread extends beyond the end of the road in upper Mill Fork canyon to well within the natural area. We observed generally disrespectful Forest use (e.g., litter) and reckless use of fire. These denigrations appear restricted to the low-gradient valley bottom of upper Mill Fork.

The northern boundary of the area should be officially posted. To protect the natural area from human-caused wildfire, camping should be prohibited in the upper Mill Fork adjacent the research natural area. Use of the upper Mill Fork by special use and range allotment permittees should be closely evaluated to assure that these users are not contributing to observed problems in, and immediately adjacent, the research natural area.

Baseline monitoring and inventory results: We conducted new inventory work in the upper, southwest portion of the natural area (Figure 7). We sampled stands of *Artemisia tridentata vaseyana/Leucopoa kingii* and *Artemisia frigida/Agropyron spicatum* located on the ridgecrest divide of the Mill Fork and Pole Creek. Both associations are relatively uncommon within southern Idaho but appear to recur with relatively constant composition and structure. Knowledge of the occurrence of *Artemisia tridentata vaseyana/Leucopoa kingii* within the site is new. Chuck Wellner reported the occurrence of *Artemisia frigida/Agropyron spicatum* within the area in 1982. Occurrence of the association is now more fully documented.

Mortality in *Pseudotsuga menziesii* due to combined effects of drought and mountain pine beetle (*Dendroctonus ponderosae*) infestation is widespread on the lower slopes of the Black Pine Mountains adjacent the research natural area. Treatment of these stands is ongoing within the region. We established a set of permanent monitoring plots in *Pseudotsuga menziesii/Berberis repens*, *Carex geyeri* stands within the site (Figure 7). The objective is to provide baseline data on compositional and structural succession of stands influenced by mountain pine beetle. Sampling methods are described in Appendix A (see Forest Stand Structure sub-section). Initial results of the monitoring activity are summarized in Table 1.

Monitoring needs and opportunities: Annual stewardship monitoring is needed at the site to assure that efforts to discourage inappropriate use of the area are effective. Stand structure and composition monitoring should be expanded to bolster the statistical power of plots established in the 2002 field season. Long-term monitoring plots could also be established in up-slope *Populus tremuloides* stands within the area. These stands are not grazed. Baseline monitoring data on these stands would be valuable for understanding stand structural and compositional changes with succession. Sheep are trailed on the upper ridgecrest of the natural area (Rust and Evenden 1996a). Monitoring plots could be established in these areas to assist in managing this use.

SAWTOOTH VALLEY PEATLANDS

Stewardship monitoring summary: Sawtooth Valley Peatland RNA lies wholly within the Sawtooth National Recreation Area. The primary management focus of the area is for recreation. Livestock grazing occurs adjacent to each of the three sites. Sites on the valley bottom may occur adjacent to private in-holdings within the national recreation area. Sawtooth Wilderness lies a short distance upslope to the west. Recent concerns have been raised regarding livestock grazing within the natural area. We conducted a stewardship monitoring visit within the Bull Moose Fen and Huckleberry Creek Fen units of the research natural area on August 30, 2002. The objective of the stewardship monitoring visit was to assess the extent of livestock use of the research natural area.

A small trail skirts adjacent the northern boundary of Bull Moose Fen. We observed evidence of light

horse travel and very old cow sign on the trail. A dispersed recreation campsite is located in the vicinity of the research natural area at the Decker Flat Road crossing of Decker Creek. There was no evidence of livestock use or recreational use of the natural area. A fence line runs parallel to the eastern boundary of the site. To prevent livestock use in the area, this fence should be maintained and the gate should be kept closed.

Heavy livestock use was observed in the Huckleberry Creek Fen unit. Numerous cow trails lead (west) into the natural area from the adjacent pasture. Severe impacts resulting from livestock rooting, trailing, pugging, and loafing have occurred within the area. Pastures on Decker Flat need to be fenced to prevent continued degradation of the research natural area.

Baseline monitoring and inventory results: No new inventory or baseline monitoring work was completed in the research natural area.

Monitoring needs and opportunities: Moseley et al. (1994) established permanent monitoring plots at Mays Creek Fen and Huckleberry Creek Fen. These monitoring plots should be re-sampled. Similar permanent monitoring plots could be established at Bull Moose Fen.

Annual stewardship monitoring is needed at Huckleberry Creek Fen to assure that measures taken to prevent livestock use of the area are effective.

The small trail adjacent Bull Moose Fen could be monitored using methods described by Cole (1989 and 1991). The objective of this monitoring regime should be to detect significant change in use patterns adjacent the natural area prior to significant alteration of research natural area values.

Small amounts of *Poa pratensis* (Kentucky bluegrass), *Poa palustris* (fowl bluegrass), *Phleum pratense* (timothy), and *Taraxacum officinale* (common dandelion) were previously reported as occurring within the area. The exotic species were often present in areas disturbed by beaver activity. Though, the exotic species did not present a concern in 2001, their abundance within the natural area should be monitored.

Recommendations and Conclusions

Research natural areas are part of a national network of ecological areas designated in perpetuity for research and education and to maintain biological diversity on National Forest System lands. Seven research natural areas occur on Sawtooth National Forest: Basin Gulch, Mount Harrison, Pole Canyon, Pole Creek Enclosure, Redfish Lake Moraine, Sawtooth Valley Peatlands, and Trapper Creek. Stewardship monitoring was conducted in each of the seven research natural areas. Permanent monitoring plots were established in relation to (1) site-specific stewardship objectives and (2) landscape-scale management concerns or biological phenomena.

Research natural areas are established in part to provide ecological reference areas which can be used to monitor and evaluate the effects of more intensive management. This management objective for research natural areas cannot be achieved if the activities of intensive management also occur within the research natural area. For example, in juniper-pinyon vegetation, does livestock grazing effect the establishment of *Juniperus osteosperma*. An important management objective for research natural areas is to establish ecological reference areas that will assist in the investigation of this kind of question.

Based on stewardship monitoring conducted in the scope of this project the, most pervasive stewardship issue facing research natural areas on Sawtooth National Forest is management of livestock grazing. Considerable progress in management of livestock access to research natural areas on the Forest is apparent. Livestock access, however, will be an on-going concern for years to come at Mount Harrison, Pole Creek Enclosure, Sawtooth Valley Peatlands, and Trapper Creek. Fencing improvements appear needed at each of these four natural areas.

Recreational use of research natural areas on the Forest is also an on-going management concern. Recreation use appears to be a current stewardship issue at Mount Harrison, Pole Canyon, Pole Creek Exclosure, and Redfish Lake Moraine. Adaptive management concepts similar to those developed by Stankey et al. (1985) may be useful for the identification of thresholds of acceptable change and specific, quantitative attributes to be employed in monitoring attainment of these goals.

Research natural areas on the Forest remain largely pristine and, with few exceptions, in much the same condition as they were when first considered for inclusion in the national network of ecological reference areas. Though certain management needs are apparent and will be ongoing for years to come, opportunity abounds for these areas to provide for research, education, and the conservation of biological diversity.

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Figure 5. Trapper Creek RNA.

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Figure 8. Sawtooth Valley Peatlands RNA.

Figure 9. Trapper Creek RNA stem plot.

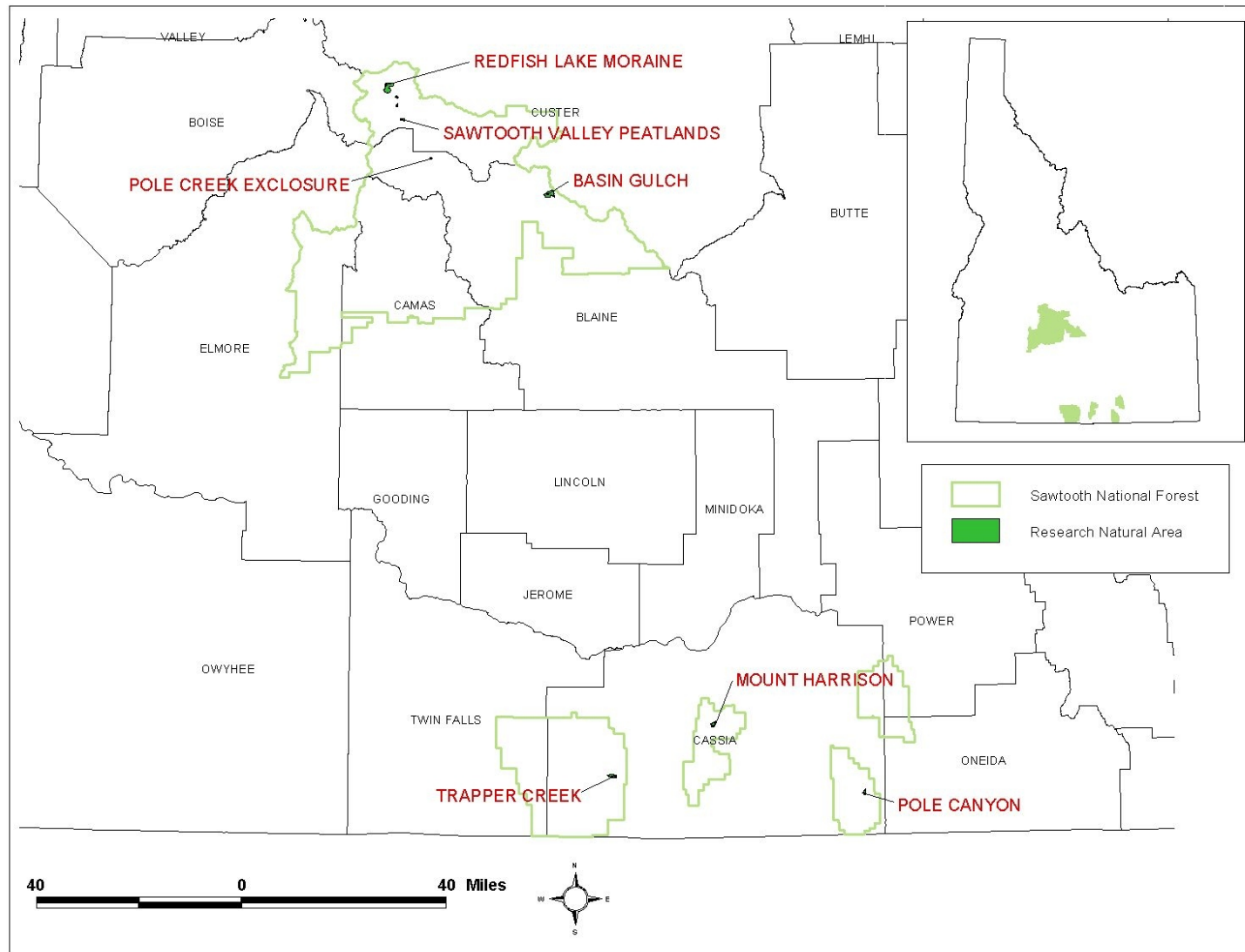


Figure 1. The study area. The location of seven research natural areas on Sawtooth National Forest is shown in relation to the Forest boundary and southern Idaho counties. The insert shows the location of Sawtooth National Forest within the state of Idaho.

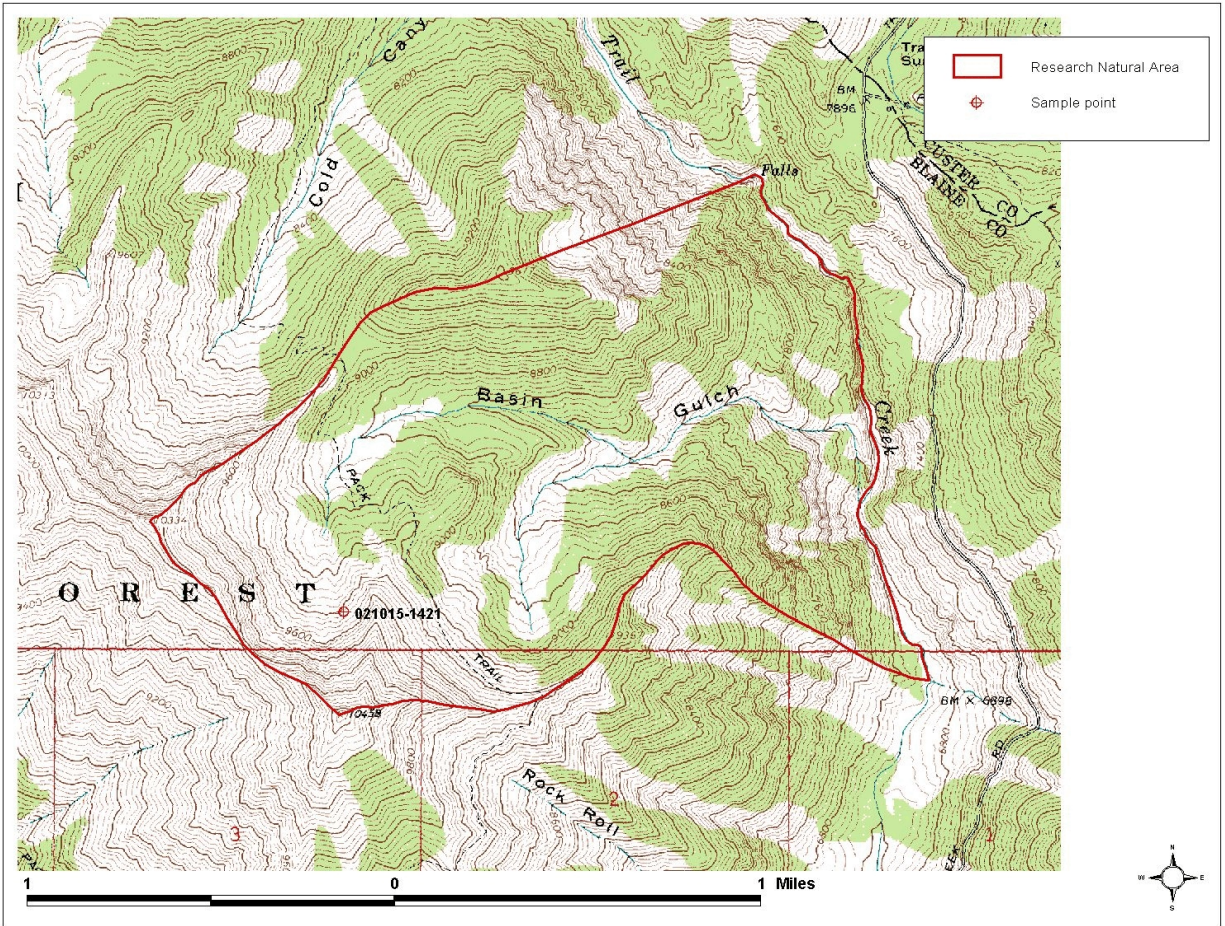


Figure 2. Basin Gulch RNA. The boundary of Basin Gulch RNA, within upper Trail Creek drainage, is shown superimposed on the Rock Roll Canyon (1:24,000) quad.

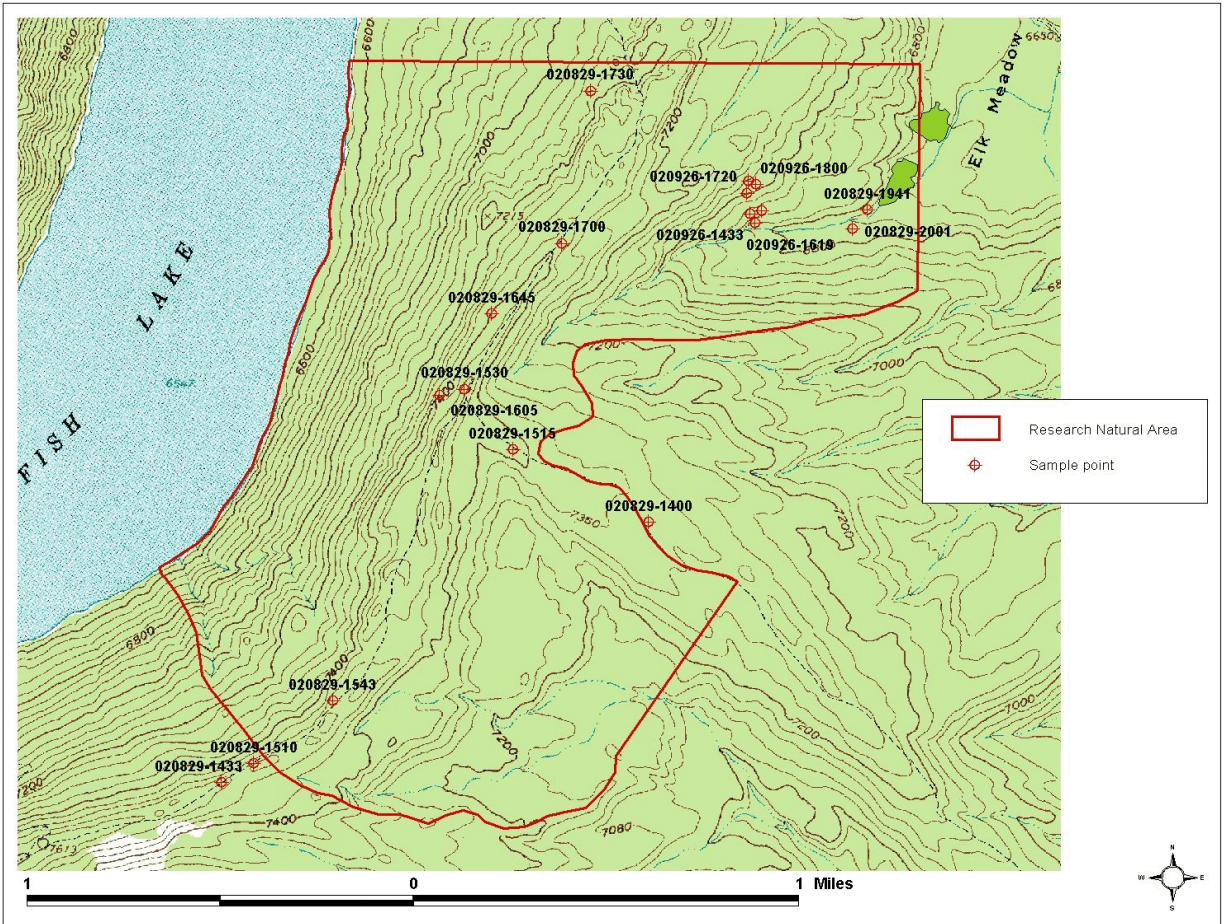


Figure 3. Redfish Lake Moraine RNA. The boundary of the natural area, located on the eastern shore of Redfish Lake, is shown superimposed on the Mt. Cramer (1:24,000) quadrangle. The approximate location of harvest units in the vicinity of the research natural area is shown by the green polygons. The plot identification of inventory and monitoring plots is shown.

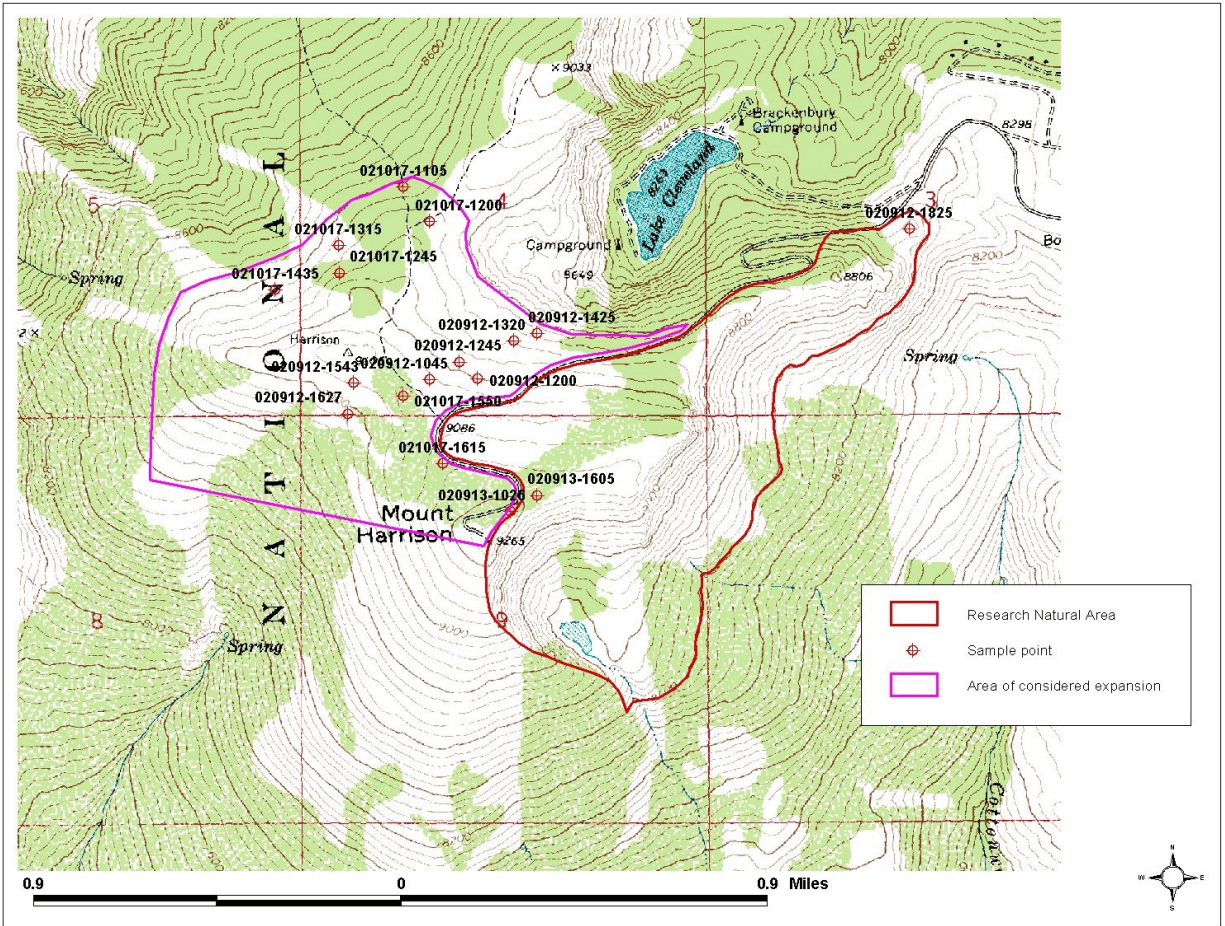


Figure 4. Mount Harrison RNA. The boundary of Mount Harrison RNA, located on the summit of Mount Harrison, is shown superimposed on the Mount Harrison (1:24,000) quadrangle. The approximate location of an area considered for expansion of the research natural area is shown. The plot identification of inventory and monitoring plots is shown.

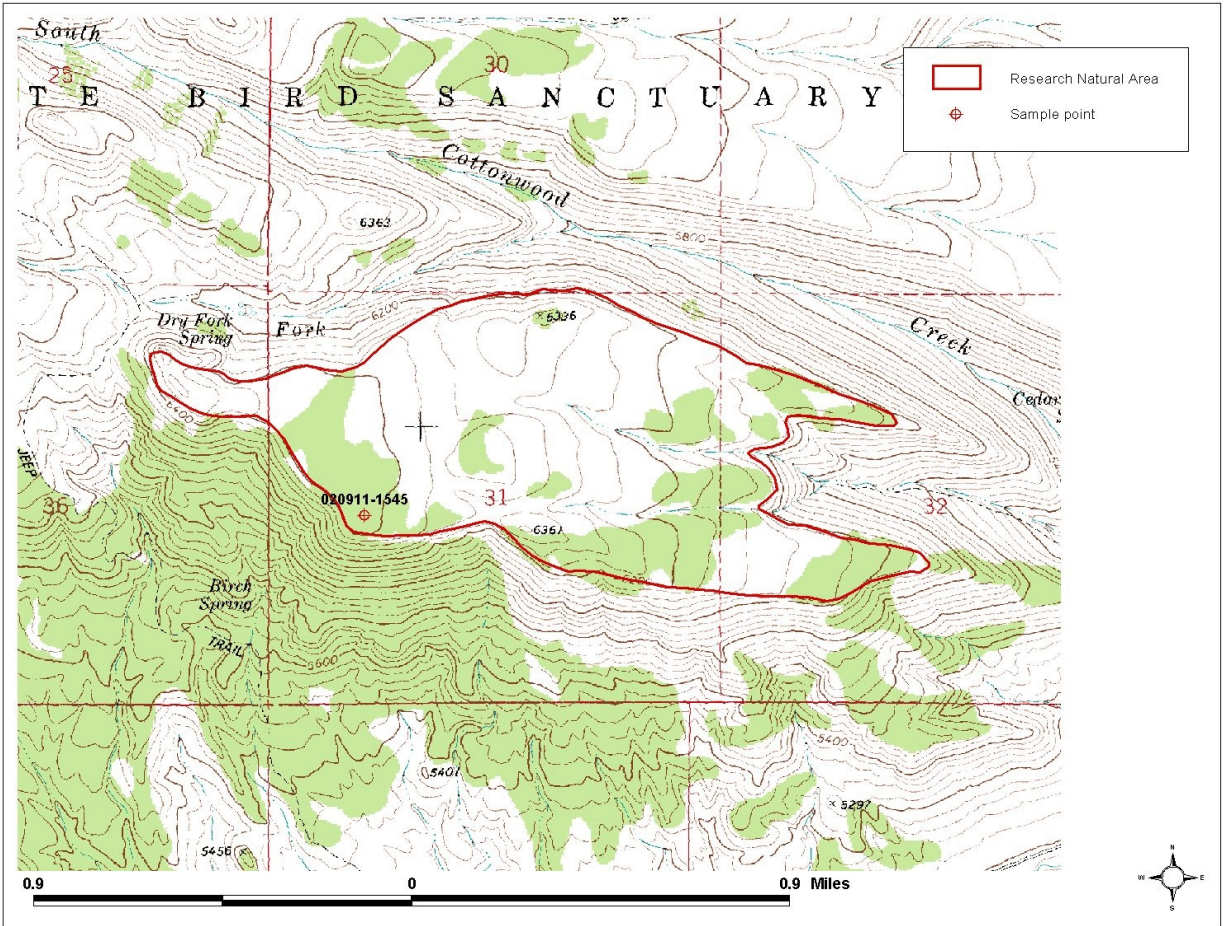


Figure 5. Trapper Creek RNA. The boundary of the natural area, located in the eastern South Hills, is shown superimposed on the Severe Spring (1:24,000) quadrangle. The plot identification of one monitoring plot established within the natural area is shown.

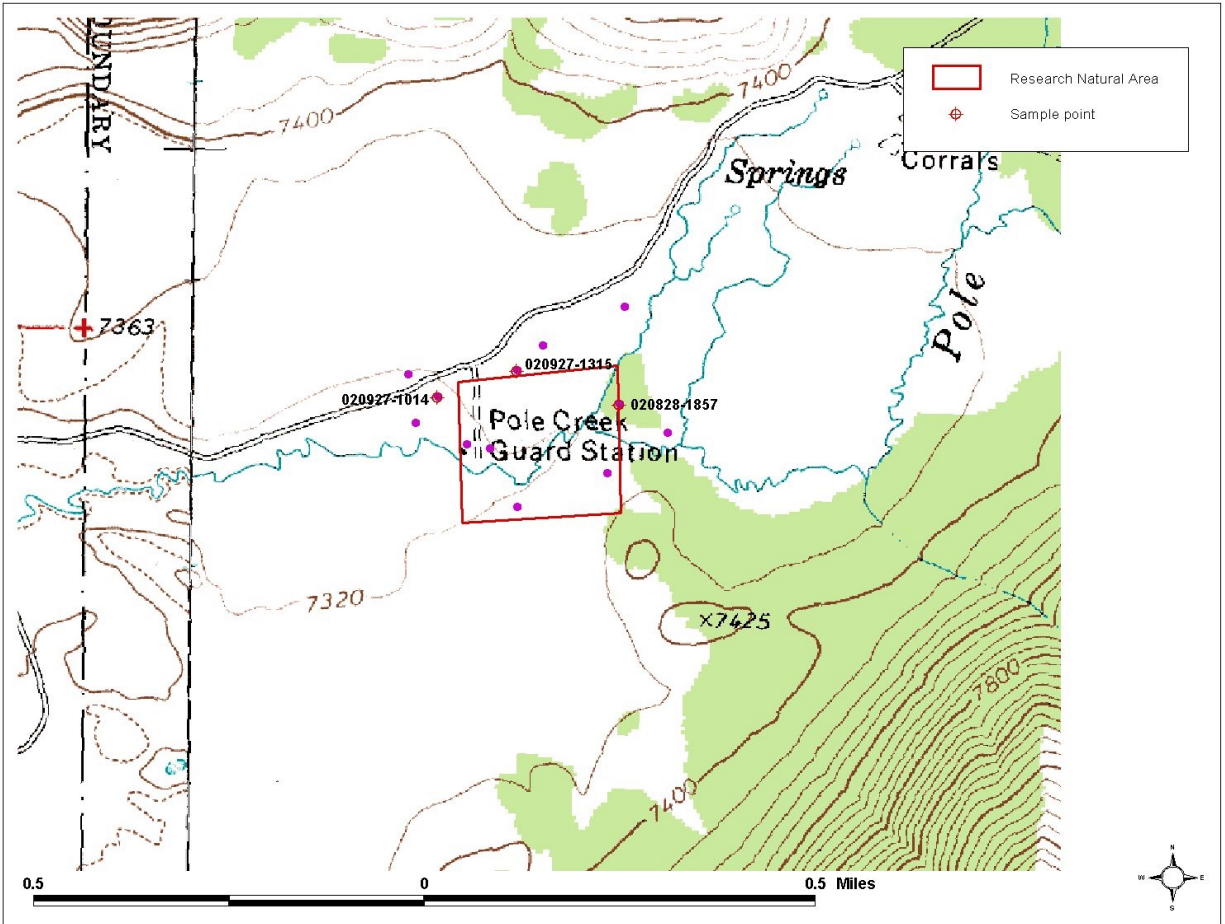


Figure 6. Pole Creek Exclosure RNA. The boundary of the research natural area, located in upper Sawtooth Valley, is shown superimposed on the Horton Peak (1:24,000) quadrangle. The boundary as shown in the current figure is in need of modification. Purple dots show the approximate location of the corner post survey monuments. The plot identifications of inventory and monitoring plots established within the natural area are shown.

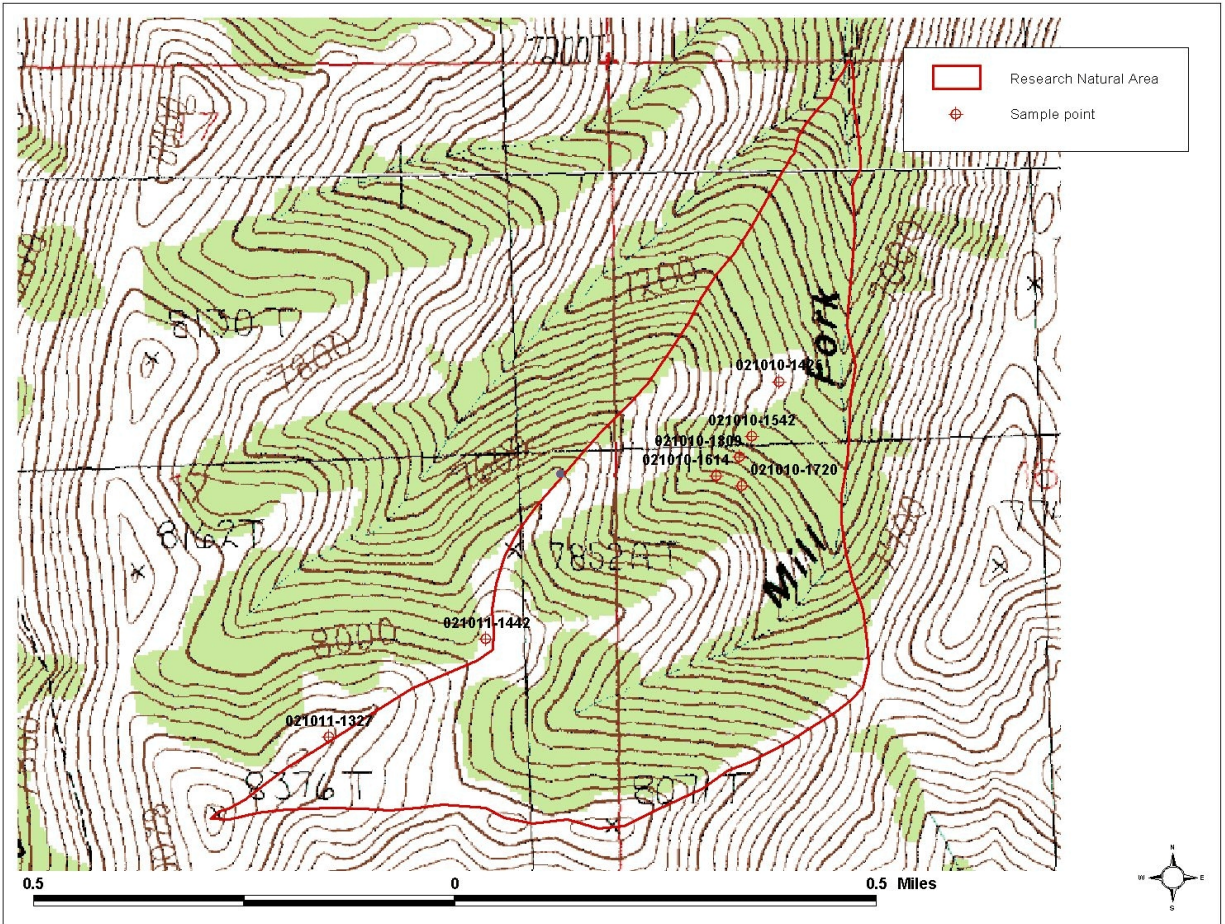


Figure 7. Pole Canyon RNA. The boundary of the research natural area, located on the northern slopes of the Black Pine Mountains, is shown superimposed on the Sweetzer Canyon (north) and Black Pine Peak (south) (1:24,000) quadrangles. Plot identifications of inventory and monitoring plots established within the research natural area are shown.

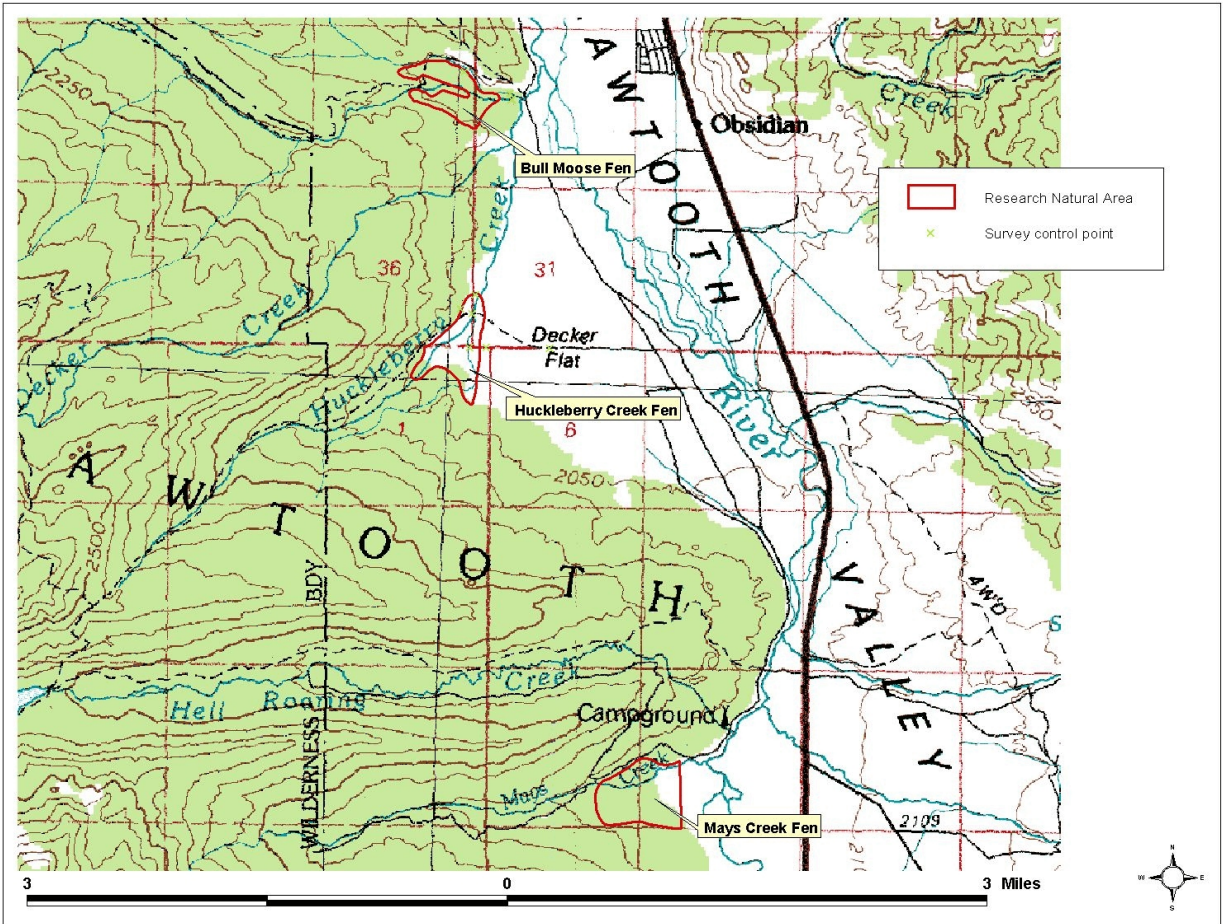


Figure 8. Sawtooth Valley Peatlands RNA. The boundaries of the three units of the research natural area, located in Sawtooth Valley, are shown superimposed on the White Cloud Peaks (1:100,000) quadrangle. Location control points taken during stewardship visits to the sites are shown.

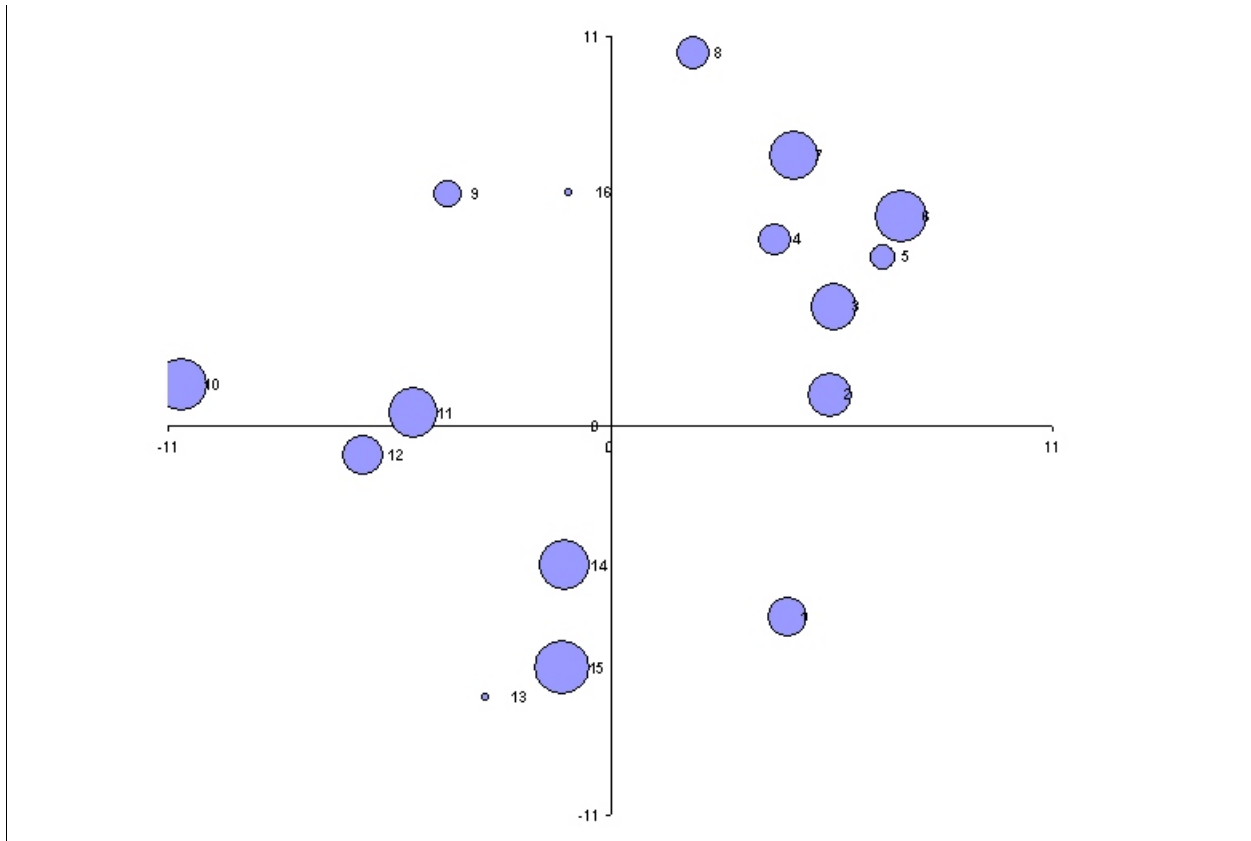


Figure 9. Trapper Creek RNA stem plot. The locations of *Juniperus osteosperma* stems located on a permanent, 0.04 ha (11.2 m radius), circular fixed-area monitoring plot located in Trapper Creek RNA are shown. The diameter circular graphic marker is proportional to the diameter at crown height of stems located on the plot.

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Table 1. Summary of stand structure monitoring results. Tree stem tally data (stems per hectare) for two sets of three plots established on Redfish Lake Moraine RNA and one set of three plots on Pole Canyon RNA are summarized by site, plot, and species. The plant association, structural class, mean (stems per hectare), standard deviation (std), and coefficient of variation (cv) are also shown. (a) Live stems. (b) Logs. (c) Snags. Plot centers are monumented by a one-inch PVC post. The coordinates of plot locations are listed in Table 5.

(a) Live stems.

Site	Association	Plot id	Species	Gt	Lt	Mt	Po	Sa	S2	
Redfish Lake Moraine	PSME/CARU	020926-1433	PINCON				49.4	345.8	395.2	
			PSEMEN		20.0	24.7	148.2	321.1	370.5	
		020926-1523	PINCON			74.1	222.3	172.9	24.7	
			PSEMEN		10.0	24.7		148.2	321.1	
		020926-1619	PINCON			74.1	271.7	543.4	864.5	
			PSEMEN			24.7	49.4	469.3	518.7	
			mean		10.0	74.1	247.0	666.9	831.6	
			std		8.2	34.9	53.4	282.3	426.1	
			cv		81.6	47.1	21.6	42.3	51.2	
		Redfish Lake Moraine	PSME/CARU	020926-1720	PSEMEN	10.0	60.0	271.7	148.2	148.2
PINCON									271.7	
020926-1800	PSEMEN			10.0	50.0	0.0	49.4	123.5	271.7	
	PINCON					24.7	123.5	197.6	98.8	
020926-1851	PINCON					24.7	123.5	197.6	98.8	
	PSEMEN			10.0	20.0	74.1	123.5	518.7	296.4	
	mean			10.0	43.3	123.5	148.2	329.3	329.3	
	std			0.0	17.0	112.3	80.7	273.8	207.0	
	cv	0.0	39.2	90.9	54.4	83.1	62.8			
Pole Canyon	PSME/BERE, CAGE	021010-1614	ABLA						148.2	
			PSEMEN			370.5	148.2	24.7	444.6	
		021010-1720	PSEMEN			222.3	74.1	24.7		
		021010-1809	PSEMEN			592.8	148.2	24.7	321.1	
			mean			395.2	123.5	24.7	304.6	
			std			152.3	34.9	0.0	242.3	
			cv			38.5	28.3	0.0	79.5	

Table 1. (continued)

(b) Logs (dead and down stems).

Site	Association	Category 1	Category 2	Gt	Lt	Mt	Po	Sa
Redfish Lake Moraine	PSME/CARU	020926-1433	PINCON			172.9		24.7
		020926-1523	PINCON			74.1	74.1	123.5
		020926-1523	PSEMEN	10.0		24.7		
		020926-1619	PINCON			98.8	24.7	197.6
		020926-1619	PSEMEN		10.0	49.4		
			mean	3.3	3.3	140.0	32.9	115.3
			std	4.7	4.7	30.8	30.8	70.8
			cv	141.4	141.4	22.0	93.5	61.4
Redfish Lake Moraine	PSME/CARU	020926-1720	PSEMEN		10.0	74.1		49.4
		020926-1800	PSEMEN		10.0	74.1		
		020926-1851	PINCON			197.6		24.7
		020926-1851	PSEMEN		10.0	123.5		
			mean		10.0	156.4		24.7
			std		0.0	116.4		20.2
			cv		0.0	74.4		81.6
Pole Canyon	PSME/BERE, CAGE	021010-1614	PSEMEN			395.2	49.4	
		021010-1720	PSEMEN			49.4	98.8	49.4
		021010-1809	PSEMEN			247.0	172.9	123.5
			mean			230.5	107.0	57.6
			std			141.7	50.8	50.8
			cv			61.4	47.4	88.1

Table 1. (continued)

(c) Snags (standing dead stems).

Site	Association	Category 1	Category 2	Lt	Mt	Po	S2	Sa
Redfish Lake Moraine	PSME/CARU	020926-1433	PINCON		74.1	24.7		24.7
		020926-1523	PINCON		24.7			
		020926-1619	PINCON		148.2	123.5		296.4
			mean		82.3	49.4		107.0
			std		50.8	53.4		134.3
			cv		61.6	108.0		125.5
Redfish Lake Moraine	PSME/CARU	020926-1720	PSEMEN		49.4			
		020926-1800	PSEMEN	10.0				
		020926-1851	PINCON		24.7			
		020926-1851	PSEMEN	10.0				
			mean	6.7	24.7			
			std	4.7	20.2			
			cv	70.7	81.6			
Pole Canyon	PSME/BERE, CAGE	021010-1614	PSEMEN		296.4	148.2		
		021010-1720	PSEMEN			148.2	49.4	172.9
		021010-1809	PSEMEN		123.5	24.7		123.5
			mean		140.0	107.0	16.5	98.8
			std		121.6	58.2	23.3	72.7
			cv		86.9	54.4	141.4	73.6

Table 2. Summary of monitoring results for Mount Harrison. Data for vascular plant species and substrate component frequency counts are shown with mean, standard deviation (std), coefficient of variation (cv), minimum detectable change (mdc), and minimum detectable change as a percent of the mean (mdc % mean). The plot is monumented by a one-inch diameter PVC post located in the understory of *Artemisia tridentata vaseyana* at 11.25 m (far side of post) due east of the plot center. The coordinates of the plot location are listed in Table 5.

Species	w1	w2	w3	n1	n2	n3	e1	e2	e3	s1	s2	s3	mean	std	cv	mdc	mdc% mean
moss	10	0	0	6	9	2	0	2	2	1	1	0	2.8	3.6	129.8	3.3	118.4
lichen	3	3	2	9	6	3	15	13	18	18	21	13	10.3	6.9	66.5	6.3	60.6
soil	14	24	21	11	7	10	14	10	13	10	13	7	12.8	5.1	40.0	4.7	36.5
gravel	24	25	25	23	16	11	19	18	23	21	24	17	20.5	4.4	21.3	4.0	19.4
rock	11	4	8	14	5	16	16	18	19	17	15	18	13.4	5.2	38.7	4.7	35.3
ANTMIC	4	1	0	6	4	3	16	5	9	8	9	12	6.4	4.6	72.0	4.2	65.7
SENCAN	6	5	2	6	1	1	5	1	2	3	6	11	4.1	3.0	73.4	2.7	67.0
PENHUM	2	3	3	4	3	7	8	6	7	3	1	4	4.3	2.2	52.3	2.0	47.7
ERIUMB	1	0	0	0	0	0	0	0	0	0	0	0	0.1	0.3	346.4	0.3	315.9
SEDLAN	9	17	12	22	11	5	12	11	14	20	22	10	13.8	5.4	39.2	4.9	35.8
CARELY	16	6	0	19	22	8	23	23	24	24	25	22	17.7	8.4	47.5	7.7	43.3
CYMDAV	6	2	5	7	1	0	5	1	0	3	5	2	3.1	2.4	78.8	2.2	71.8
GEUROS	5	0	0	0	1	3	0	0	0	1	0	0	0.8	1.6	190.3	1.4	173.5
POASEC	7	14	10	1	1	8	2	4	2	3	1	2	4.6	4.2	92.3	3.9	84.2
ARABIS	3	3	5	0	2	1	0	0	0	0	1	0	1.3	1.7	132.7	1.5	121.0
CASTILLEJA	3	0	0	5	3	3	4	0	3	5	5	4	2.9	1.9	66.1	1.8	60.3
ERIGERON	5	4	1	15	0	2	2	1	0	6	10	5	4.3	4.5	105.3	4.1	96.0
POACUS	1	0	3	0	0	0	0	0	0	0	0	0	0.3	0.9	266.3	0.8	242.8
ARECAP	11	7	3	15	4	14	5	2	3	9	9	8	7.5	4.3	57.6	3.9	52.5
PHLPUL	10	8	13	21	10	13	13	8	8	16	13	17	12.5	4.0	32.3	3.7	29.4
ARTRV	0	1	7	0	9	0	0	1	2	0	0	0	1.7	3.1	183.3	2.8	167.2
SOLMUL	0	5	6	1	6	0	0	1	0	0	1	0	1.7	2.5	147.7	2.2	134.7
ARECON	0	2	4	0	0	0	0	0	0	0	0	0	0.5	1.2	248.6	1.1	226.7
CHADOU	0	1	1	0	0	0	0	0	0	0	0	0	0.2	0.4	233.5	0.4	213.0
ERILAN	0	4	4	0	0	0	0	0	0	0	0	0	0.7	1.6	233.5	1.4	213.0
ACHMIL	0	1	3	0	1	6	0	0	0	0	0	0	0.9	1.8	199.8	1.7	182.2
ERIMIC	0	1	0	0	0	0	0	0	0	0	0	0	0.1	0.3	346.4	0.3	315.9
LEUKIN	0	0	2	0	0	2	0	0	0	0	0	1	0.4	0.8	190.3	0.7	173.5
DRABA	0	0	2	0	0	0	0	0	0	0	0	0	0.2	0.6	346.4	0.5	315.9
PEDCON	0	0	0	0	1	0	1	0	0	0	0	0	0.2	0.4	233.5	0.4	213.0
LINPER	0	0	0	0	0	0	0	0	0	0	1	1	0.2	0.4	233.5	0.4	213.0
LUPINUS	0	0	0	0	0	0	0	0	0	0	0	4	0.3	1.2	346.4	1.1	315.9

Table 3. Summary of monitoring results - Trapper Creek RNA. Data for species composition and stand structure are shown with mean, standard deviation (std), coefficient of variation (cv), minimum detectable change (mdc), and minimum detectable change as a percent of the mean (mdc % mean). (a) Species frequency data. (b) Summary of stand structure data. (c) Stem size and location data. The plot is monumented at plot center by a one-inch diameter PVC post. The coordinates of the plot location are listed in Table 5.

(a). Species frequency data.

Species	s	n	e1	e2	e3	w1	w2	w3	mean	std	cv	mdc	mdc % mean
ARTARB	2	2	2	0	1	1	0	2	1.0	0.9	89.4	1.3	127.5
FESIDA	2	3	6	0	0	0	2	6	2.3	2.9	126.2	4.2	179.8
BALHOO	2	2	1	0	0	0	1	0	0.3	0.5	154.9	0.7	220.8
ERICEA	1	1	0	0	0	0	0	0	0.0	0.0		0.0	
COLPAR	3	3	16	0	13	11	0	7	7.8	6.7	86.0	9.6	122.5
LOMATIUM	1	3	0	0	0	0	0	0	0.0	0.0		0.0	
POASEC	2	0	12	0	0	5	11	8	6.0	5.3	87.6	7.5	124.8
AGOSERIS	2	1	0	0	0	0	0	1	0.2	0.4	244.9	0.6	349.1
PHLLON	1	2	0	0	10	0	0	6	2.7	4.3	162.0	6.2	230.9
BROTEC	1	2	3	0	0	0	0	0	0.5	1.2	244.9	1.7	349.1
ARABIS	1	3	4	0	0	2	0	1	1.2	1.6	137.3	2.3	195.7
ALLACU	1	0	0	0	5	2	0	0	1.2	2.0	175.0	2.9	249.4
SITHYS	2	3	0	2	7	3	1	2	2.5	2.4	97.2	3.5	138.5
PHLHOO	1	1	0	0	0	0	0	0	0.0	0.0		0.0	
GILMIC	1	1	0	0	5	4	2	11	3.7	4.1	112.7	5.9	160.6
PEDSIM	0	1	0	0	0	0	0	0	0.0	0.0		0.0	
PENHUM	0	3	2	0	0	3	1	2	1.3	1.2	90.8	1.7	129.4
STITHU	0	2	0	0	0	5	3	5	2.2	2.5	114.6	3.5	163.3
OPUPOL	0	0	1	0	0	0	0	0	0.2	0.4	244.9	0.6	349.1
ASTPUR	0	0	1	0	0	0	0	0	0.2	0.4	244.9	0.6	349.1
CRYPT ANN	0	0	1	1	0	0	4	1	1.2	1.5	126.2	2.1	179.8
SENINT	0	0	0	0	2	0	4	0	1.0	1.7	167.3	2.4	238.5
ERIMIC	0	0	0	0	1	0	0	0	0.2	0.4	244.9	0.6	349.1
MICGRA	0	0	0	0	1	0	0	2	0.5	0.8	167.3	1.2	238.5
ANTDIM	0	0	0	0	0	0	0	1	0.2	0.4	244.9	0.6	349.1
LOMTRI	0	0	0	0	0	0	0	1	0.2	0.4	244.9	0.6	349.1

(b). Summary of stand structure data.

Status	Gt	Lt	Mt	Po	S2
Dead and down	10.0				
Old growth form	20.0	60.0	98.8	24.7	
Young growth form					49.4

(c). Stem size and location data.

Stem id	Distance	Azmuth	dch
1	7.1	141.0	19.4
2	5.6	81.0	25.0
3	6.6	59.0	27.6
4	6.8	38.0	14.5
5	8.4	55.0	8.5
6	9.5	51.0	34.0
7	9.1	31.0	29.9
8	10.9	11.0	13.5
9	7.8	328.0	10.0
10	10.9	276.0	33.5
11	5.0	274.0	32.3
12	6.3	262.0	21.8
13	8.5	202.0	1.0
14	4.2	196.0	30.6
15	7.1	190.0	37.1
16	6.8	351.0	1.0

Table 4. Summary of monitoring results for Pole Creek Exclosure RNA. Data for vascular plant species and substrate component frequency counts are shown with mean, standard deviation (std), coefficient of variation (cv), minimum detectable change (mdc), and minimum detectable change as a percent of the mean (mdc % mean). The plot centers is monumented by a one-inch PVC post. The coordinates of the plot location are listed in Table 5.

Species	w1	w2	w3	n1	n2	n3	e1	e2	e3	s1	s2	s3	mean	std	cv	mdc	mdc % mean
ARTRV	3	3	3	2	4	3	3	6	2	3	8	2	3.5	1.8	51.0	1.6	46.5
CREACU	5	1	0	2	5	3	2	0	1	3	0	0	1.8	1.9	100.9	1.7	92.0
KOECRI	7	9	8	20	2	5	10	7	10	12	5	11	8.8	4.5	51.3	4.1	46.8
CALEUR	7	11	7	9	12	10	9	13	13	9	12	7	9.9	2.3	22.9	2.1	20.9
FESIDA	22	11	21	17	11	13	20	21	21	18	21	20	18.0	4.1	22.7	3.7	20.7
ANTMIC	8	0	0	0	0	0	0	0	1	0	0	0	0.8	2.3	306.8	2.1	279.8
AGRSPI	2	0	6	3	1	3	5	1	3	5	0	3	2.7	2.0	73.9	1.8	67.4
SITHYS	1	0	0	0	0	0	0	0	0	0	0	0	0.1	0.3	346.4	0.3	315.9
ASTPER	1	1	0	0	0	0	0	0	0	0	0	0	0.2	0.4	233.5	0.4	213.0
ERIUMB	0	1	7	4	3	3	1	1	3	3	0	1	2.3	2.0	89.1	1.8	81.3
LUPINUS	0	2	4	5	5	3	3	10	7	1	3	2	3.8	2.7	72.9	2.5	66.5
CHRVIS	0	0	4	0	0	2	2	0	1	0	0	1	0.8	1.3	152.1	1.2	138.7
Mertensia sp	0	0	1	0	0	0	0	0	0	0	0	0	0.1	0.3	346.4	0.3	315.9
ARABIS	0	0	0	0	0	0	0	0	1	1	0	2	0.3	0.7	195.4	0.6	178.2
ERIPHER	0	0	0	0	0	0	0	0	0	0	2	9	0.9	2.6	284.7	2.4	259.6
Castilleja sp	0	0	0	0	0	4	0	2	8	0	0	0	1.2	2.5	212.6	2.3	193.9
rock	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0		0.0	
gravel	14	9	25	13	11	13	13	18	25	23	20	24	17.3	5.9	33.8	5.4	30.9
soil	2	1	12	3	3	1	3	8	9	8	3	13	5.5	4.3	77.7	3.9	70.9
lichen	1	0	2	3	0	6	1	16	23	7	15	19	7.8	8.3	106.6	7.5	97.2
moss	0	0	0	2	1	2	6	1	8	2	4	4	2.5	2.5	101.6	2.3	92.7

Table 5. Permanent plot locations. The locations of permanent plots established on Sawtooth National Forest RNAs are listed by site and plot identification. Universal transverse mercator (UTM) coordinates using the 1927 North American datum (NAD27) are shown.

Site	Plot id	UTM easting	UTM northing
Trapper Creek	020911-1545	744185	4671954
Redfish Lake Moraine	020926-1433	668091	4886700
	020926-1523	668139	4886714
	020926-1619	668113	4886662
	020926-1720	668074	4886786
	020926-1800	668111	4886824
	020926-1851	668079	4886838
Pole Creek Exclosure	020927-1014	681172	4864370
Mt. Harrison	020913-1605	281129	4687473
Pole Canyon	021010-1614	328379	4664944
	021010-1720	328427	4664923
	021010-1809	328424	4664978

Appendix A. Monitoring protocols.

Following a detailed descriptions of sampling methods used on long-term monitoring plots. The methods are described in the order they appear in the text.

Forest Stand Structure: Tree stems are tallied by species, status, and size class on nested 0.04 ha. (11.3 m radius) and 0.1 ha (17.8 m radius) circular plots. Live tree stems, standing dead stems, and logs (of sapling size or greater, see below) are tallied on the 0.04 ha circular plot. Large live tree stems (> 20.9 inches diameter at 4.5 feet), snags, and logs are tallied on the 0.1 ha circular plot. Plots are clustered in groups of three, with each plot center placed 50 m apart. From any one of the three plots, the other two are located 60 degrees apart. Thus, each cluster of plots forms an equilateral triangle with the sides equal to 50 m. Plot centers are monumented by one-inch diameter PVC posts.

Following is a summary of status and size class conventions used:

Tree stem size classes

Code	Size class	Range
S1	seedling 1	< 6.0 inches tall
S2	seedling 2	> 6.0 inches
SA	sapling	1.0 - 4.9 inches dbh
PO	pole	5.0 - 8.9 inches dbh
MT	medium tree	9.0 - 20.9 inches dbh
LT	large tree	21.0 - 32.9 inches dbh
GT	very large tree	33.0 and greater

Tree stem decay classes

Code	Status	Description
Standing dead (snags)		
SD1	decay class 1	bark, stemwood, and fine branch structure is intact
SD2	decay class 2	few limbs and no fine branches are present; the bark is partially broken; some stem decay may be present
SD3	decay class 3	only limb stubs are present; the bark is broken and sloughing; stem decay is evident
SD4	decay class 4	few limb stubs are present; the stem is usually broken and with evident decay; little bark remains
SD5	decay class 5	no limb stubs are present; the stem is broken and rotten; no bark remains
Dead and down (logs)		
DD1	decay class 1	bark, stemwood, and fine branch structure is intact
DD2	decay class 2	few limbs and no fine branches are present; the bark is partially broken; some stem decay may be present
DD3	decay class 3	only limb stubs are present; the bark is broken and sloughing; stem decay is evident
DD4	decay class 4	few limb stubs are present; the stem is usually broken with evident decay and conforming to microtopography; little bark remains
DD5	decay class 5	no limb stubs are present; the stem is broken, rotten and partially integrated into the soil; no bark remains

Species Composition: The percent frequency of rooted vascular plant species and substrate components (moss, lichen, soil, gravel, and rock) is measured on 12 1 x 1 m quadrats. Frequency is determined as the number of 20 x 20 cm cells each species is rooted in (there are 25 20 x 20 cm cells within each 1 x 1 m quadrat). Three quadrats are located (beginning) at 3, 6, and 9 m along each of four lines emulating from plot center in the four cardinal directions. All quadrat frames are placed on the left side (looking from plot center out) of the tape. Plot centers are monumented by one-inch diameter PVC posts.

Juniper Woodland Stand Structure: The diameter at crown height is measured for each tree stem on the 0.04 ha (11.3 m radius) circular plot. The location of each tree stem is documented as the distance (measured to the in-ward edge of the stem) and (true north) azimuth of the stem from plot center. Plot centers are monumented by one-inch diameter PVC posts.

Appendix B. Site basic records.

Idaho Conservation Data Center
Site Record

BASIN GULCH
24

Location

Ecoregion Section: CHALLIS VOLCANICS SECTION (M332F)
Watershed: 17040219028
County: Blaine
USGS Quadrangle(s): ROCK ROLL CANYON

LAT: 434840N S: 434801N E: 1141531W
LONG: 1141649W N: 434919N W: 1141804W

Legal Description (township/range, section, meridian, note)

005N018E 01-03 BO
006N018E 25,26,34-36 BO UNSURVEYED

Directions: Basin Gulch is located near the divide between the Snake and Salmon River drainage basins in the southeastern end of the Boulder Mountains, ca 9 miles (14.6 km) northeast of Sun Valley. At the junction of US Route 93 and Forest Service (FS) Road FH51 (Trail Creek Road), in the center of Ketchum, go ca 12 miles (19.4 km) up Trail Creek Road to Trail Creek Summit. Continue northeastward on Trail Creek Road ca 0.7 mile (1.1 km). Turn left on FS Road 140 and go ca 1.2 miles (1.9 km) to the streambank next to Trail Creek. Cross Trail Creek (must wade or use log crossing) and find FS Trail #124 up Cold Canyon. Follow FS Trail #124 ca 1.5 miles (2.4 km) up Cold Canyon and up the slope to the Cold Canyon - Basin Gulch divide, which is the northern boundary of the RNA. The trail continues through the north cirque and on through the south cirque of Basin Gulch.

Imagery: The following aerial photos are located in the Forest Supervisor's and District Ranger's offices:
8-2-77 F16 ST 16013 3 77 140, 8-2-77 F16 ST 16013 3 77 141, 8-2-77 F16 ST 16013 3 77 142.

Site Design

Designer: Wellner, C. A.
Date: 89-12-23

Design Justification: The boundaries of the RNA encompass the entire Basin Gulch watershed.

Site Comments: Steve Rust and Jennifer Miller of Idaho Department of Fish and Game, Conservation Data Center conducted a stewardship monitoring survey in 2002 on 15 October. Species composition and environment relations were documented on a 0.1 acre fixed ecological plot. The plot identification number is 021015-1421. Vegetation on upper scree slope (plot id 021015-1421) is tentatively classified as *Ribes montigenum*/*Haplopappus suffruticosus*. A plant species list was compiled.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 1,175.00
Primary Acres: 1,175.00

Elevation range (feet): 6,650 10,458

Site Description: Basin Gulch is a small, complete watershed containing two cirques and a steep gradient stream with many cascades and waterfalls. Elevations range from 6,650 feet (2027 m) at Trail Creek in the southeastern corner of the RNA to 10,458 feet (3188 m) on the highest summit at the head of Basin Gulch. *Pinus albicaulis* (whitebark pine) and *P. flexilis* (limber pine) stands contain trees of large size and great age. The highest peak in the area supports subalpine vegetation and some alpine species. The area also contains three *Abies lasiocarpa* (subalpine fir) habitat types, extensive areas of scree vegetation, scree meadows, and areas with *Artemisia tridentata* ssp. *vaseyana* (mountain big sagebrush) habitat types. Also of interest, is the extensive coverage of a dwarfed (<10' tall) *Abies lasiocarpa* forest, maintained by large, frequently-occurring avalanches.

Key Environmental Factors: The topographical and elevational complexities of the area have resulted in a diversity of plant communities. "Pygmy" forests of *Abies lasiocarpa* are maintained by periodic avalanches.

Climate: Winters in the area are influenced by Pacific Maritime weather systems. The period from late fall through early spring is moist and warmer than might be expected for mountainous country. Periodically, the Pacific weather systems are interrupted by cold, dry systems from Canada. Continental climatic conditions prevail in the summer months resulting in low precipitation and relative humidity. Daily temperature variation can be 40 degrees F to 50 degrees F (22 degrees C to 28 degrees C) or more.

Landuse History: The site does not have a history of mining, grazing, or timber harvest.

Cultural Features: There are no known presettlement cultural features from the site.

Element Occurrences (element/size/occurrence type):

ABIES LASIOCARPA/ARNICA CORDIFOLIA	55
ABIES LASIOCARPA/CAREX GEYERI	40
ABIES LASIOCARPA/RIBES MONTIGENUM	250
ABIES LASIOCARPA/RIBES MONTIGENUM	55
PSEUDOTSUGA MENZIESII/JUNIPERUS COMMUNIS	20
ARTEMISIA TRIDENTATA VASEYANA/AGROPYRON SPICATUM	8
ARTEMISIA TRIDENTATA VASEYANA/FESTUCA IDAHOENSIS	8

Biodiversity Significance:

The RNA contains outstanding examples of communities associated with avalanche paths. The "pygmy forest" of *Abies lasiocarpa* is one. There are very large *Pinus albicaulis* and *P. flexilis* occurring in the RNA. *Pinus flexilis* on slopes east of the RNA and on the other side of Trail Creek have been aged at 1,500 to 2,000 years old.

Other Values:

The site is a small complete watershed with steep topography and deep snow accumulation. It has high watershed values. The stream flowing through the RNA has many cascades and waterfalls.

Protection and Stewardship

Designation: RESEARCH NATURAL AREA

Protection Urgency: P4. The area is an established RNA.

Information Needs: Plant inventory was taken in the following plant association type: *Ribes montigenum/Haplopappus suffruticosus*. However, more plant community inventory is needed to verify element occurrences as well as surveys to identify the flora and fauna present.

Management Urgency: M4. No major threats to the RNA have been reported. There is little evidence of recreation use where the trail crosses the stream. FS Trail #124 shows minimal trail impact and narrows as it proceeds up the canyon. There is no evidence of social trails. However, social trails, fire rings, and campsites could become evident due to the accessibility into the area and water sources

Management Needs: As of 1999, no protection or management activities occur at this site and none are necessary because of low human impact on the area. Protective and interpretive signs about the RNA should be installed where FS Trail #124 and the RNA boundaries intersect.

Current Landuse:

Onsite: Basin Gulch RNA is allocated to Management Area 3D lands in the Sawtooth National Forest Land and Resource Management Plan. Due to difficult access, the area receives little recreational use.

Offsite: The site is bordered on the north, south, and west by Management Area 3B lands, which are lands managed for dispersed recreation in primitive, semi-primitive, and semi-primitive motorized settings. The site is bordered on the east by Management Area 3B-2 lands, which are scenic travel routes.

Exotic Species Comments: In 2002, *Taraxacum officinale* (common dandelion) was observed.

Pests/Pathogens Comments:

Managed Area Comments:

References

- U88WEL15IDUS Wellner, C. A., and R. K. Moseley. 1988. Establishment record for Basin Gulch Research Natural Area within Sawtooth National Forest, Blaine County, Idaho. USDA Forest Service. 18 pp.
- U82WEL04IDUS Wellner, C. A. 1982. Recommended research natural areas, Sawtooth National Forest. Unpublished report prepared for the U.S. Department of Agriculture, Forest Service, Sawtooth National Forest. 11 pp.
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- U72USF01IDUS USDA Forest Service, Intermountain Region. 1972. Ecological description and evaluation - White Cloud, Boulder, and Pioneer Mountains. USDA Forest Service, Intermountain Region, Ogden, UT. 92 pp.
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- U72PLA01IDUS Platts, W. S. 1972. Aquatic environment and fisheries study - Boulder and Pioneer Mountain areas. USDA Forest Service, Intermountain Region, Ogden, UT. 79 pp.
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Record Maintenance:

Edition: 96-08-28, A. H. Pitner

This report was printed on 03-06-03.

Idaho Conservation Data Center
Site Record

REDFISH LAKE MORaine
480

Location

Ecoregion Section: IDAHO BATHOLITH SECTION (M332A)
Watershed: 17060201065
County: Custer
USGS Quadrangle(s): MT. CRAMER

LAT: 440625N S: 440533N E: 1145326W
LONG: 1145439W N: 440718N W: 1145549W

Legal Description (township/range, section, meridian, note)

009N013E	10	BO	SE4; unsurveyed
009N013E	11	BO	S2; unsurveyed
009N013E	12	BO	W2SW4; unsurveyed
009N013E	13	BO	W2NW4; unsurveyed
009N013E	14	BO	W2, N2NE4, SW4SE4; unsurveyed
009N013E	15	BO	E2, SE4SW4; unsurveyed
009N013E	22	BO	NE4, E2NW4, N2SE4; unsurveyed
009N013E	23	BO	NW4, N2SW4, W2NE4; unsurveyed

Directions: Redfish Lake Moraine RNA is located on the east side of Redfish Lake in the Sawtooth Valley, ca 8.5 miles (13.8 km) south of Stanley, Idaho. From Stanley, at the junction of State Routes 21 and 75, turn south onto State Route 75 and travel for ca 4.2 miles (6.8 km) to the intersection with Forest Service (FS) Road 214 (to Redfish Lake). Turn southwest (right) onto FS Road 214. Follow the road to the east side of the lake. Look for trailhead (FS Trail 045). Follow the trail southward for ca 1 mile (1.6 km) to the northern boundary of the RNA. The RNA can also be reached by following the shoreline southward from the boat ramp on the eastern shore for ca 1 mile (1.6 km) to the northwest corner of the RNA.

Imagery: The following aerial photos are available at the Forest Supervisor's Office: 9-9-77 F16 ST 16037, 1277 136 through 1277 138; 9-9-77 F16 ST 16037 1277 161; 9-21-93 USDA F 12 614140, 1592-106 through 1592-110; and 07-30-92 USDA F 12 614140, 292-13 through 292-17.

Site Design

Designer: Wellner, C. A.

Date: 83-01-27

Design Justification: The boundaries were drawn to include glacial deposits of three ages. The eastern boundary is constrained by timber harvest areas.

Site Comments: On 15 August, Miriam Austin of Red Willow Research conducted a stewardship monitoring survey. Observations on current management concerns were recorded. Stewardship monitoring surveys were also conducted in 2001 on 18, 19 May; 31 August; 23 September; and in 2002 on 17, 18, 19 May by Miriam Austin. On 29 and 30 of August 2002, Steve Rust, Jennifer Miller, and Cyndi Coulter of Idaho Department of Fish and Game, Conservation Data Center conducted stewardship monitoring surveys. The RNA was entered from the trailhead (FS Trail 045) and point observation ecology plots were established (plot id 020829-1941, 020829-2001, 020829-1433, 020829-1510, 020829-1543, 020829-1730, 020829-1645, 020829-1700, 020829-1400, 020829-1515, 020829- 1530, and 020829-1605). The lakeshore trail at the west end of the RNA was also surveyed. On 26 September 2002, fixed monitoring plots and tree data where established east of Elk Meadow by S. Rust, J. Miller, and Luana McCauley (plot id. 020926-1851, 020926-1523, 020926-1433, 020926-1800, 020926-1720, and 020926-1619). A plant species list was also compiled.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 1,499.60

Primary Acres: 1,499.60

Elevation range (feet): 6,547 7,520

Site Description: Redfish Lake Moraine RNA encompasses a section of the large lateral moraine on the east side of Redfish Lake, and three different ages of glacial deposits occur in the area. The youngest covers the steep inner slope of the moraine and the two older deposits cover the relatively gentle outer slope. Elevations range from 6,547 feet (1984 m) along the western boundary on the shore of Redfish Lake to 7,520 feet (2279 m) on the ridgeline above the lake. Much of the area has *Pinus contorta* (lodgepole pine) in various stages of succession, *Pseudotsuga menziesii* (Douglas- fir), or *Abies lasiocarpa* (subalpine fir) series habitat types. On the flat benches of the outer slope of the moraine, *Pinus contorta* occurs in stands where the older age class is being replaced by a younger age class. It is difficult to tell whether the stand will eventually be *Pseudotsuga menziesii* or *Abies lasiocarpa* climax. Several communities are restricted to a narrow zone along Redfish Lake shoreline. They communities are affected either by cold air drainage or a high water table. The *Abies lasiocarpa/Vaccinium scoparium* (grouse whortleberry) habitat type falls in the former category, while several communities fall into the latter, including *Abies lasiocarpa/Menziesia ferruginea* (menziesia), *Abies lasiocarpa/Ledum glandulosum* (Labrador-tea), *Alnus sinuata* (sitka alder) plant associations. There is also a community that occurs below the mean high water line of the lake.

Key Environmental Factors:

Climate: Winters in the area are influenced by Pacific Maritime weather systems. The period from late fall through early spring are moist and warmer than might be expected for mountainous country. Periodically, the Pacific weather systems are interrupted by cold, dry systems from Canada. Continental climatic conditions prevail in the summer months resulting in low precipitation and

relative humidity. Daily temperature variation can be 40 degrees F to 50 degrees F (22 degrees C to 28 degrees C) or more.

Landuse History: The site has no known history of mining, grazing, or timber harvest.

Cultural Features: There are no known presettlement cultural features from the site.

Element Occurrences (element/size/occurrence type):

PINUS CONTORTA/CAREX GEYERI	23640
ABIES LASIOCARPA/CALAMAGROSTIS RUBESCENS	30
ABIES LASIOCARPA/CAREX GEYERI	15940
ABIES LASIOCARPA/CALAMAGROSTIS CANADENSIS, LEDUM GLANDULOSUM PHASE	15960
PSEUDOTSUGA MENZIESII/CALAMAGROSTIS RUBESCENS	294
PSEUDOTSUGA MENZIESII/VACCINIUM CAESPITOSUM	10
ALNUS SINUATA	1010
ABIES LASIOCARPA/CALAMAGROSTIS CANADENSIS, VACCINIUM CAESPITOSUM PHASE	10
ABIES LASIOCARPA/MENZIESIA FERRUGINEA, MENZIESIA FERRUGINEA PHASE	15960
ABIES LASIOCARPA/VACCINIUM SCOPARIUM, CALAMAGROSTIS RUBESCENS PHASE	15960
PSEUDOTSUGA MENZIESII/CAREX GEYERI, CAREX GEYERI PHASE	30690

Biodiversity Significance:

Redfish Lake is the spawning site for the endangered *Oncorhynchus nerka* (sockeye salmon), and it supports *Salvelinus confluentus* (bull trout), a candidate for listing. In 1993, a *Falco peregrinus* (peregrine falcon) pair was documented nesting on cliffs west of the lake. The raptors could potentially use the RNA for foraging or other activities.

Other Values:

The site includes an excellent example of glaciation processes and contrast in glacial tills.

Protection and Stewardship

Designation: RESEARCH NATURAL AREA

Protection Urgency: P4. The area is an established RNA.

Information Needs: Plant inventory data was taken in the following plant association types: *Abies lasiocarpa*/*Calamagrostis rubescens* (pinegrass), *Pseudotsuga menziesii*/*Carex geyeri* (elk sedge)-*Carex geyeri*, *Pseudotsuga menziesii*/*Vaccinium caespitosum*, *Abies lasiocarpa*/*Carex geyeri* *Abies lasiocarpa*/*Calamagrostis canadensis*-*Vaccinium caespitosum*, and *Pseudotsuga menziesii*/*Calamagrostis rubescens*. However, more plant community inventory is needed to verify element occurrences along with inventory surveys to identify the flora and fauna present. Additional data information and comparisons to fire frequency or successional patterns within the habitats represented in the RNA might be useful for management activities.

Management Urgency: M3. Timber harvest activities adjacent to the RNA could impact the area. There is some concern that cutting might occur within the RNA boundary. The lakeside trail and FS Trail 045 are highly traveled with well established tread. Due to high usage social trails, fire rings and campsites could become established and impact the RNA.

Management Needs: RNA boundaries need to be marked and accompanied by some type of interpretative signs that would explain RNA purposes and goals to the public. A frequent monitoring schedule needs to be established in order to maintain RNA integrity. This will help identify any increasing or inappropriate levels of use in a timely manner. The lakeshore, both within and adjacent to the RNA, needs to be surveyed to determine if any restoration closures are warranted. There are trails in need of repair to prevent erosion, down cutting, and the formation of gullies, and some trail signs need to be repaired. There is also a need to eliminate motorized vehicle access on the east boundary of the RNA.

Current Landuse:

Onsite: The site is allocated to Management Area 4A-12 lands in the Sawtooth Land and Resource Management Plan. A trail traverses the RNA, but recreational use is light and impacts are minimal. In 2000, a large volume of foot traffic impacted the lakeshore adjacent to and within the RNA. This resulted in soil compaction, loss of groundcover, firewood scavenging, a loss of woody forest debris, and multiple undersigned trails converging along the lakeshore. Small cold springs, creeks, and steep trails were also impacted by foot traffic. Recreational uses in the area include hiking, hunting, fishing, horseback riding and/or other riding/pack stock use, and mountain biking.

Offsite: The site is surrounded by Forest Service lands and within Management Area 4A-13 lands. These lands are managed to provide for dispersed and developed recreation activities in areas conveniently accessed by automobile and other recreational vehicles. In 2000, a large improved campground, with paved access, was reported in close proximity of the RNA's northern boundary.

Exotic Species Comments: No exotic species were specifically noted during the 2000 survey, but this may change with increased use of horses and other recreational livestock.

Pests/Pathogens Comments:

Managed Area Comments: Redfish Lake Moraine is exclusively located within the Sawtooth National Forest, Sawtooth National Recreational Area.

References

U00AUS07IDUS Austin, M. L. 2000. Basic stewardship monitoring data for Redfish Lake Moraine Research Natural Area. Unpublished report prepared for the United States Department

of Agriculture, Forest Service, Intermountain Region by Red Willow Research, Burley, Idaho. 12 pp. plus appendices.

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U72PLA01IDUS Platts, W. S. 1972. Aquatic environment and fisheries study - Boulder and Pioneer Mountain areas. USDA Forest Service, Intermountain Region, Ogden, UT. 79 pp.

F02RUS04IDUS Rust, S. K., J. J. Miller, and C. L. Coulter. 2002. Field data sheets for stand inventory and monitoring on Sawtooth National Forest Research Natural Areas. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise. Not paged.

Record Maintenance:

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 This report was printed on 03-06-03.

Idaho Conservation Data Center
Site Record

MOUNT HARRISON
164

Location

Ecoregion Section: NORTHWEST BASIN AND RANGE SECTION (342B)
Watershed: 17040209 and 17040210
County: Cassia
USGS Quadrangle(s): MOUNT HARRISON

LAT: 421842N S: 421810N E: 1133812W
LONG: 1133857W N: 421915N W: 1133938W

Legal Description (township/range, section, meridian, note)

013S024E	03	BO	SW4, NW4SE4
013S024E	04	BO	S2SE4
013S024E	09	BO	NE4, E2NW4, N2SE4
013S024E	10	BO	W2NW4

Directions: Mount Harrison is located in the Albion Mountains, ca 14 miles (22.7 km) southwest of Albion, Idaho. From Albion, travel southeast on State Route 77 for ca 4 miles (6.5 km) to the intersection with Howell Canyon Road, which becomes Forest Service (FS) Road 549. Travel south on FS Road 549 for ca 9 miles (14.6 km) to the northeastern corner of the RNA. The site is south of the road.

Imagery: The following aerial photos are located in the Burley District Ranger's office and provide coverage of the Mount Harrison area: Script 55, Roll 22 and 23, 4-120. The photos are dated March 1978.

Site Design

Designer: Wellner, C. A.
Date: 87-10-22

Design Justification: The boundaries were drawn to include at least portions of the four rare plant populations that occur on Mount Harrison. The boundaries also encompass a diversity of plant communities and geologic features. The northern boundary is adjacent to FS Road 549.

Site Comments: In 1999, Miriam Austin of Red Willow Research conducted stewardship monitoring surveys on 18 June; 10 July, 26 August; 19 September, and in 2000 on 19, 22, 26 June; 3, 4, 17, 19, 20, 26 July; 7, 20, 25 August; 5 September, and 1, 8 October. Observations on current management concerns were recorded and in 1999, livestock use data was collected. In 2001, stewardship monitoring surveys were conducted by Red Willow Research volunteers and Western Watersheds personnel on 8, 21 July; 8 August; 4, 6, 7, 18, 24, 25, 29 September, and 17 October. Steve Rust and Jennifer Miller of Idaho Department of Fish and Game, Conservation Data Center conducted stewardship monitoring surveys and surveyed proposed boundary enlargement in 2002 on 12, 13 September. On 17 October 2002, S. Rust did a follow up in the proposed boundary enlargement area. Species composition and environment relations were documented on 0.1 acre fixed ecological plots (plot id 020912-1200, 020912-1045, 020912-1627, 020912-1543, 020913-1605, 021017-1315, 021017-1615, and 021017-1435) and stand level point observation ecological plots (plot id 021017-1105, 021017-1200, 021017-1245, and 021017-1550). A fixed monitoring plot was established to the north of the Mount Harrison Fire Outlook Tower (plot id 020913-1026). Ecological plots were performed outside of the existing RNA boundary because of a proposal to enlarge the Mount Harrison RNA. A plant species list was also compiled.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 381.00
Primary Acres: 381.30

Elevation range (feet): 8,400 9,240

Site Description: Mount Harrison is the highest peak in the Albion Range of southern Idaho. The area includes subalpine habitats on the eastern slopes of Mount Harrison consisting of gently-sloping meadows and a small basin. Elevations range from 8,400 feet (2560 m) along the eastern boundary to 9,240 feet (2816 m) near the summit of Mount Harrison. The basin is a rocky, steep-walled cirque with a pool at the bottom. The pool is vernal in dry years, but contains water in wet years. A sagebrush-grass community lies east of the pool. Most of the area is cliff, boulder, and scree slopes. The north rim supports tundra-like vegetation containing a number of alpine species. A forest of *Abies lasiocarpa* (subalpine fir), *Pinus flexilis* (limber pine), and *Juniperus communis* (common juniper) are located along the western boundary; and *Abies lasiocarpa* and *Pinus flexilis* are scattered in the northeastern portion of the area. Mount Harrison RNA supports four special status plant species that are narrowly distributed in Idaho: *Castilleja christii* (Christ's Indian paintbrush), *Cymopterus davisii* (Davis wavewing), *Machaeranthera laetevirens* (vivid green aster), and *Machaeranthera shastensis* var. *latifolia* (Shasta aster).

Key Environmental Factors: The steep topography and distribution of geologic substrates result in some very distinct vegetation patterns. For example, both *Pinus flexilis* and *Abies lasiocarpa* occur on south slopes in the area. The *Pinus flexilis* is restricted to calcareous substrates, while *Abies lasiocarpa* occurs on quartzite.

Climate: As typical for southern Idaho, the climate is relatively dry. The highest temperatures usually occur in July and the lowest in January. Over one-third of the mean annual precipitation occurs between April and June with a small peak occurring in December and January. Precipitation throughout the remainder of the year is relatively constant.

Landuse History: The meadows surrounding the summit of Mount Harrison were historically grazed by sheep and cattle.

Cultural Features: There are no known presettlement cultural features within the site.

Element Occurrences (element/size/occurrence type):	
ABIES LASIOCARPA/RIBES MONTIGENUM	45
PINUS FLEXILIS/CERCOCARPUS LEDIFOLIUS	10
ARTEMISIA TRIDENTATA VASEYANA-SYMPHORICARPOS OREOPHILUS/BROMUS CARINATUS	20
ARTEMISIA ARBUSCULA ARBUSCULA/AGROPYRON SPICATUM	10
ARTEMISIA TRIDENTATA VASEYANA/FESTUCA IDAHOENSIS	120
CAREX ELYNOIDES TURF	10
CYMOPTERUS DAVISII	314 AC
CASTILLEJA CHRISTII	200 AC

Biodiversity Significance: B1

Castilleja christii, Cymopterus davisii, Machaeranthera shastensis var. latifolia and Machaeranthera laetevirens are special status plant species. Castilleja christii is endemic to Mount Harrison and in 2002 was given a G1/S1 ranking. Cymopterus davisii is endemic to the Albion Range and is known from only two other sites. Machaeranthera laetevirens is known from only three other sites in Idaho and Nevada. Mount Harrison RNA is the only documented occurrence for Machaeranthera shastensis var. latifolia in Idaho. The site also supports a diversity of plant communities that are not usually found at these high elevations. The occurrence of Cercocarpus ledifolius (curlleaf mahogany) in the Pinus flexilis/Cercocarpus ledifolius habitat type is unusual, and a number of species that normally occur at alpine elevations are found on the windswept rim of the cirque headwall.

Other Values:

The RNA also has high watershed values, and contains some striking geologic features.

Protection and Stewardship

Designation: RESEARCH NATURAL AREA

Protection Urgency: P3. In 1996, the area was established as a RNA.

Information Needs: Twenty permanent transects in and out of the RNA were established in 1996 to monitor the Castilleja christii population (Moseley 1996). Transects were resampled in 1996 (Moseley 1997). Inventory of the fauna and flora and additional data on population status of special status species are needed. Interpretive pamphlets describing vegetation and wildlife values are needed and should be made available at the Mount Harrison Lookout Tower and/or Sawtooth National Forest offices. In 2002, Plant inventory was taken in the following plant associations: Carex elynoides turf, Artemisia tridentata ssp. vaseyana/Festuca idahoensis, Artemisia tridentata ssp. vaseyana series, Abies lasiocarpa/Ribes montigenum, Pinus flexilis/Cercocarpus ledifolius, Festuca idahoensis series, Agropyron trachycaulum series, snow bed, and tall forb. However, more plant community inventory is needed to verify element occurrences along with inventory surveys to identify the flora and fauna present.

Management Urgency: M3. Unauthorized off road vehicle use in accessible portions of the RNA and cattle wandering up to the lower (southeast) boundary are concerns. There are also concerns with impact due to recreation use and encroachment of exotic plant species. Non-native plants were introduced as part of the rehabilitation effort following road construction and paving activities to the lookout. In 2002, a faint social trail at the summit is visible through the vegetation and large rock. It is also evident that numerous rocks have been removed and presumably thrown downslope. There is little evidence of livestock and old cow pies in proposed area outside of the existing RNA boundary.

Management Needs: The status of trespass grazing in the lower portion of the RNA should be monitored. Inappropriate and unauthorized uses need to be monitored and discouraged as much as possible, and rare plant habitat needs to be monitored. In order to prevent future problems, a specific monitoring schedule should be implemented. Permanent fencing for the prevention of livestock access into the RNA and rare plant habitat needs to be established and/or withdraw the upper Mount Harrison region from livestock grazing. The RNA boundaries need to be extended to include rare plant habitat. Protective and interpretive signs, regarding the RNA, should be installed.

Current Landuse:

Onsite: Mount Harrison is a RNA and is allocated to Management Area 1E lands in the Sawtooth National Forest Land and Resource Management Plan. The area receives some recreational use but mostly in areas near FS Road 549. The Mount Harrison Fire Lookout Tower is near the western boundary of the RNA. In 1999, trespassing cattle impacted marshy areas around Thompson Flat, Twin Lakes, and rare plant habitat. Cattle caused microbiotic crust compaction. Recreational use left minimal trash around the lookout area, in the rare plant habitat areas, and the Lake Cleveland area. At the northern tip of the RNA, recreational access caused soil compaction and vegetation trampling. Equestrian use near the lookout left some soil disturbance. In 2000, the RNA habitat improved due to the lack of domestic livestock grazing and disturbance. Some disturbance within the RNA occurred from both snowmobile use and motorcycle off-road use. Foot traffic resulted in trampled vegetation immediately adjacent to the parking lot, the lookout, and immediately adjacent to the paved interpretive trails. The high volume of annual visitors to Mount Harrison, especially at the summit, leads to ongoing concerns for littering, compaction, and disturbance within the RNA and rare plant habitats.

Offsite: The site is bordered on the north by Management Area 1C lands. These are lands managed to provide recreational opportunities that are conveniently accessible by automobile or other recreational vehicles. The site is bordered on the south by Management Area 1A-1 lands, which are managed as scenic travel areas. In 1999 and 2000, neighboring areas received recreational uses ranging from hiking and plant viewing to hang-gliding and recreational vehicle use. Livestock grazing occurred on lands immediately adjacent to the RNA.

Exotic Species Comments: In 1999 and 2000, introduced species including Rumex crispus (curly dock) and Bromus inermis (smooth brome), were noted at the road edges. Non-native grasses increased in areas as a result of the loss of forbs in 1999 by livestock disturbances.

Pests/Pathogens Comments:

Managed Area Comments:

References

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- U98MOS11IDUS Moseley, R. K. 1998. Christ's paintbrush monitoring on the Sawtooth National Forest: third-year results. Conservation Data Center, Idaho Department of Fish and Game, and Sawtooth National Forest. 10 pp. plus appendices.
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- U92HUD01IDUS Hudak, H. 1992. Biological evaluation for sensitive plants, Howell Canyon Road Improvement Environmental Assessment, Burley Ranger District, Sawtooth National Forest, Cassia County, Idaho. USDA Forest Service, Sawtooth National Forest, Burley Ranger District. 7 pp.
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- U82WEL04IDUS Wellner, C. A. 1982. Recommended research natural areas, Sawtooth National Forest. Unpublished report prepared for the U.S. Department of Agriculture, Forest Service, Sawtooth National Forest. 11 pp.
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- A73HOL02IDUS Holmgren, N. H. 1973. Five new species of *Castilleja* (Scrophulariaceae) from the Intermountain region. Bulletin of the Torrey Botanical club 100(2): 83-93.
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Idaho Conservation Data Center
Site Record

TRAPPER CREEK
489

Location

Ecoregion Section: NORTHWEST BASIN AND RANGE SECTION (342B)
Watershed: 17040211007
County: Cassia
USGS Quadrangle(s): SEVERE SPRING

LAT: 420956N S: 420937N E: 1140058W
LONG: 1140210W N: 421016N W: 1140316W

Legal Description (township/range, section, meridian, note)

014S020E	36	BO	NE4
014S021E	31	BO	N2, N2S2
014S021E	32	BO	W2

Directions: Trapper Creek RNA is located on the eastern slope of the South Hills in southern Idaho, ca 12 miles southwest of Oakley, Idaho. From Oakley, take Forest Service (FS) Road 500 westward for ca 1 mile (1.6 km) to the junction with FS Road 533. Continue on FS Road 533 southward along the West Canal for ca 2.5 miles (4.1 km) where it branches to the southwest. Continue on FS Road 533 along Lower Goose Creek Reservoir and Trapper Creek for about 6.5 miles (10.5 km). Here a trail follows South Cottonwood Creek for about 0.75 mile (1.2 km). At this point the trail branches, one fork westward and one fork northerly, take the westward fork and follow the trail to its end. Continue to climb the drainage to the top of the plateau and the RNA. In 1999 and 2000, access was only obtainable by 4-wheel drive. The trail near Cottonwood Creek was not accessible without adverse impact due to the stream running directly down the old roadway. Access was by the 4-wheel drive route to the west of the RNA and up the saddle near Dry Fork Spring. From the saddle, access was by hiking up onto the west or southwest edge of the RNA.

Imagery: The following aerial photos are available at the Forest Supervisor's Office: 8-3087
USDA-F 16 614142, 387-105 through 387-106.

Site Design

Designer: Wellner, C. A.
Date: 87-05-31

Design Justification: The boundaries encompass the plateau between Cottonwood Creek and Trapper Creek. The steep breaks around the plateau form the boundary.

Site Comments: In 1999, Miriam Austin of Red Willow Research conducted stewardship monitoring surveys on 13 June; 3, 4 July; 19 October; and in 2000 on 25 March; 8 August. Also in 2000, a brief aerial survey was conducted on 4 September and observations on current management concerns were recorded. In 2002, Steve Rust and Jennifer Miller of Idaho Department of Fish and Game, Conservation Data Center conducted a stewardship monitoring survey on 11 September. Species composition and environment relations were documented on a 0.1 acre fixed ecological monitoring plot. The plot identification number is 020911-1545. A plant species list was compiled.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 508.30
Primary Acres: 508.30

Elevation range (feet): 5,920 6,400

Site Description: Trapper Creek RNA encompasses a mesa on the eastern slope of the South Hills. The mesa dips gently from west to east. Short basalt cliffs ring most of the mesa, lying in sharp contrast to the sedimentary tuff deposits of the surrounding area. Elevations range from 5,920 feet (1794 m) to 6,400 feet (1939 m). The vegetation is comprised largely of *Juniperus osteosperma* (Utah juniper) in various mixtures with *Artemisia arbuscula* (low sagebrush) and *Festuca idahoensis* (Idaho fescue), which occurs on shallow soils. Where stands of *Juniperus osteosperma* become more open, *Artemisia arbuscula* habitat types dominate the shallow soil sites. In some areas, *Artemisia arbuscula* occurs in 50:50 mixtures with *Artemisia nova* (black sagebrush). Occasionally, a few small stands of pure *Artemisia nova* are encountered. Deeper soils, found in the center of the area, are currently dominated by *Chrysothamnus nauseosus* (gray rabbitbrush), *Artemisia tridentata* ssp. *vaseyana* (mountain big sagebrush) and/or *Artemisia tridentata* ssp. *wyomingensis* (Wyoming big sagebrush), as well as a lush mixture of grasses including *Festuca idahoensis*, *Agropyron spicatum* (bluebunch wheatgrass), and *Elymus cinereus* (basin wildrye). Most of this area was previously burned and numerous skeletons of *Juniperus osteosperma* are present. This indicates that in the past junipers were more important within this community.

Key Environmental Factors:

Climate: Winters in the area are primarily influenced by Pacific Maritime weather systems. The period from late fall through early spring is moist and warmer than might be expected for mountainous country. Periodically, the Pacific weather systems are interrupted by cold, dry systems from Canada. Continental climatic conditions prevail in the summer months resulting in low precipitation and relative humidity. Daily temperature variation can be 40 degrees F to 50 degrees F (22 degrees C to 28 degrees C) or more. Annual precipitation peaks in May and June.

Landuse History: The site was historically grazed by horses. Grazing has not occurred for many years due to low forage and distance from water.

Cultural Features: In 1999, Native American artifacts were discovered.

Element Occurrences (element/size/occurrence type):

ARTEMISIA ARBUSCULA ARBUSCULA/POA SECUNDA	7290
ARTEMISIA NOVA/POA SECUNDA	9
ARTEMISIA ARBUSCULA THERMOPOLA/FESTUCA IDAHOENSIS	7290
JUNIPERUS OSTEOSPERMA/FESTUCA IDAHOENSIS	11780
JUNIPERUS OSTEOSPERMA/ARTEMISIA ARBUSCULA ARBUSCULA/FESTUCA IDAHOENSIS	11780
JUNIPERUS OSTEOSPERMA/ARTEMISIA TRIDENTATA VASEYANA/FESTUCA IDAHOENSIS	11780
PEDIOCACTUS SIMPSONII	

Biodiversity Significance:

The site contains relatively undisturbed examples of less productive shrub types and *Juniperus osteosperma* communities.

Other Values:

Recreational use includes hiking and hunting.

Protection and Stewardship

Designation: RESEARCH NATURAL AREA

Protection Urgency: P4. In 1996, the area was established as a RNA.

Information Needs: Plant inventory was taken in the following plant association: *Juniperis osteosperma/Artemisia arbuscula-Festuca idahoensis*. However, more plant community inventory is needed to verify element occurrences along with inventory surveys to identify the flora (including lichens) and fauna present.

Management Urgency: M4. Prior to 1999, there were no major threats reported. In 2002, abundant cow pies were observed in adjacent draw and in the draw at the west end of the RNA.

Management Needs: In order to prevent future problems, livestock should be removed from the general area and/or permanent wildlife fencing installed to prevent livestock access to the RNA. Inappropriate and unauthorized use of the RNA needs to be discouraged and/or monitored during accessible months especially during grazing seasons. Protective and interpretive RNA signs should be installed.

Current Landuse:

Onsite: The RNA is allocated to Management Area 2H lands (Trapper Creek proposed RNA) in the Sawtooth Land and Resource Management Plan. The surrounding land use is cattle grazing. In 1999, cattle accessed the north sides of the RNA and were present towards the middle of the RNA causing disturbance to vegetation. In 2000, livestock were still accessing and foraging within the RNA leading to continued soil disturbance, loss of native groundcover and cryptogamic soil crusts, soil erosion, and continued invasion of exotic annuals. Livestock were also disturbing cultural values within the RNA. Artifact collection activities were evident.

Offsite: The site is surrounded by Forest Service lands within Management Area 2A lands, which are lands managed for general timber and range production. In 1999, cattle grazing occurred within the forest. Salt blocks were placed immediately below the RNA mesas and in the higher meadow/spring areas on the Bostetter side. Signs of post cutting among Junipers existed along the road between the Main Trapper Creek Road and the RNA area. Signs of hauling loads of building rock were on the main Bostetter Road. Livestock grazing, in 2000, occurred on lands adjacent to the RNA.

Exotic Species Comments: In 1999 and 2000, soil disturbance by cattle led to the establishment of *Bromus tectorum* (cheat grass) especially at the east end of the RNA. *Bromus tectorum* has slowly and will continue to invade other open-soil as well as rocky locations. A continued expansion of exotic annual grasses will potentially lead to an increase in wildfires.

Pests/Pathogens Comments: In 1999, a type of blight and/or rust affected *Populus tremuloides* (quaking aspen) and *Amelanchier utahensis* (serviceberry) along the northern mesa edges. In 2000, a widespread gall-forming insect infestation was observed on primarily serviceberry. The infestation was present within and adjacent to the RNA.

Managed Area Comments:

References

- U96RUS07IDUS Rust, S. K., and A. G. Evenden. 1996. Establishment record for Trapper Creek Research Natural Area within Sawtooth National Forest, Cassia County, Idaho. Unpublished report prepared for the U.S. Forest Service Intermountain Research Station, Ogden, UT. 12 pp. plus appendices and maps.
- U88MOS09IDUS Moseley, R. K. 1988. Establishment record for Trapper Creek Research Natural Area within Sawtooth National Forest, Cassia County, Idaho. USDA Forest Service. Draft.
- U82WEL04IDUS Wellner, C. A. 1982. Recommended research natural areas, Sawtooth National Forest. Unpublished report prepared for the U.S. Department of Agriculture, Forest Service, Sawtooth National Forest. 11 pp.
- U96RUS05IDUS Rust, S. K. 1996. Classification and inventory for the conservation and management of pinyon-juniper ecosystems. Summary of 1996 field season sampling effort. Unpublished report prepared by Idaho Conservation Data Center, Department of Fish and Game, for USDI Bureau of Land Management, Burley Resource Area, and USDA Forest Service, Intermountain Research Station. 20 pp.
- U97RUS06IDUS Rust, S. K. 1997. Pinyon-juniper woodland classification and description in research natural areas of Southeast Idaho. Unpublished report prepared for USDI Bureau of Land Management, Burley Field Office and USDA Forest Service Northern Region, Intermountain Region and Intermountain Research Station. Conservation Data Center,

- Idaho Department of Fish and Game, Boise. 84 pp.
- U99RUS03IDUS Rust, S. K. 1999. Pinyon-juniper woodland classification and description in Research Natural Areas of southeastern Idaho. In: Monson, S. B.; Stevens, Richard, (compilers). 1999. Proceedings: ecology and management of pinyon-juniper communities within the interior west. 1997 September 15-18, Provo, UT. Proc. RMRS-P-9. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 411 pp.
- U99AUS04IDUS Austin, M. L. 2000. Basic stewardship monitoring data for Trapper Creek RNA. Unpublished report prepared for the United States Department of Agriculture, Forest Service, Intermountain Region by Red Willow Research, Burley, Idaho. Not paged.
- U00AUS05IDUS Austin, M. L. 2000. Basic stewardship monitoring data for Trapper Creek RNA. Unpublished report prepared for the United States Department of Agriculture, Forest Service, Intermountain Region by Red Willow Research, Burley, Idaho. 11 pp. plus appendices.
- F02RUS04IDUS Rust, S. K., J. J. Miller, and C. L. Coulter. 2002. Field data sheets for stand inventory and monitoring on Sawtooth National Forest Research Natural Areas. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise. Not paged.

Record Maintenance:

Edition: 96-08-28, A. H. Pitner
 This report was printed on 03-06-03.

Idaho Conservation Data Center
Site Record

POLE CREEK EXCLOSURE
485

Location

Ecoregion Section: IDAHO BATHOLITH SECTION (M332A)
Watershed: 17060201083
County: Blaine
USGS Quadrangle(s): HORTON PEAK

LAT: 435440N S: 435435N E: 1144420W
LONG: 1144427W N: 435445N W: 1144435W

Legal Description (township/range, section, meridian, note)
007N015E 30 BO NW4; UNSURVEYED

Directions: Pole Creek Exclosure is located near Pole Creek Guard Station. It is on the eastern edge of the Sawtooth Valley at the foot of the Boulder Mountains, ca 27 miles southeast of Stanley, Idaho. From Stanley, at the junction of State Routes 21 and 75, travel south-southeast on State Route 75 for ca 24 miles (38.9 km) to the intersection with Pole Creek Road/ Forest Service (FS) Road 194. Pole Creek Road (FS Road 194) is just south of Sawtooth City. Turn east onto Pole Creek Road and travel for ca 3 miles (4.9 km) to the historic Pole Creek Guard Station. The exclosure is south of the road.

Imagery: The following aerial photos are available at the Forest Supervisor's Office: 9-9-77, F16, ST 16013, 1277 67; and 8-18-92, USDA F, 12, 614140, 692-6 and 692-5.

Site Design

Designer: Wellner, C. A.
Date: 82-08-02

Design Justification: The site consists of an old horse pasture that now excludes cattle. The fence line of the pasture forms the boundaries of the RNA.

Site Comments: In 1999, Miriam Austin of Red Willow Research conducted stewardship monitoring surveys on 18 October; 7 November; and in 2000, on 7 September. Observations on current management concerns were recorded. In 2001, stewardship monitoring surveys were conducted by M. Austin on 17, 18, May; 30, 31, August; and 23 September. In 2002, Steve Rust, Jennifer Miller, and Cyndi Coulter of Idaho Department of Fish and Game, Conservation Data Center conducted stewardship monitoring surveys on 28 August. A point observation ecology plot (plot id 020828-1857) was established in forested area and the perimeter boundary log fence was surveyed. On 27 September 2002, a 0.1 acre fixed ecological plot and a fixed monitoring plot were established by S. Rust, J. Miller, and Luana McCauley in the northwest area of the RNA. Plot identification numbers are 020927-1315 and 020927-1014 respectively. A plant species list was compiled.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 32.00
Primary Acres: 32.00
Elevation range (feet): 7,320 7,360

Site Description: Pole Creek Exclosure RNA occurs in the center of the wide valley bottom of Pole Creek along the east side of the Sawtooth Valley. Pole Creek has cut a shallow, relatively wide flood plain through undulating, well-drained glacial deposits. Elevations in the area vary little from 7,320 feet (2218 m) to 7,360 feet (2230 m). Vegetation is comprised of *Artemisia tridentata* ssp. *vaseyana* (mountain big sagebrush) habitat types on xeric upland sites, *Abies lasiocarpa* (subalpine fir) habitat type on mesic upland sites, and *Pinus contorta* (lodgepole pine), *Salix* spp. (willow) and *Carex* spp. (sedge) community types on saturated substrates along Pole Creek.

Key Environmental Factors:

Climate: Winters in the area are influenced by Pacific Maritime weather systems. The period from late fall through early spring is moist and warmer than might be expected for mountainous country. Periodically, the Pacific weather systems are interrupted by cold, dry systems from Canada. Continental climatic conditions prevail in the summer months resulting in low precipitation and relative humidity. Daily temperature variation can be 40 degrees F to 50 degrees F (22 degrees C to 28 degrees C) or more.

Landuse History: The site is an old horse pasture for the Pole Creek Guard Station.

Cultural Features: There are no known presettlement cultural features from the site.

Element Occurrences (element/size/occurrence type):

ABIES LASIOCARPA/CALAMAGROSTIS RUBESCENS	360
ARTEMISIA TRIDENTATA VASEYANA/AGROPYRON SPICATUM	1070
SALIX BOOTHII/CAREX UTRICULATA	180
SALIX WOLFII/CAREX UTRICULATA	180
ARTEMISIA TRIDENTATA VASEYANA/FESTUCA IDAHOENSIS	1070
CAREX UTRICULATA	180
POTENTILLA FRUTICOSA/DANTHONIA INTERMEDIA	180

Biodiversity Significance:

The site contains sagebrush/grass and riparian communities in excellent ecological condition.

Other Values:

The site provides an excellent example of grazed versus ungrazed riparian and upland habitats.

Protection and Stewardship

Designation: RESEARCH NATURAL AREA

Protection Urgency: P4. In 1996, the area was established as a RNA.

Information Needs: In 2002, plant inventory data was taken in the following plant association types: *Abies lasiocarpa*/*Calamagrostis rubescens* (pinegrass) and *Artemisia tridentata* ssp. *vaseyana*/*Festuca idahoensis*. However, more plant community inventory is needed to verify element occurrences along with inventory surveys to identify the flora and fauna present. Plant surveys should be conducted at various stages during the growing season. Vernal ponds should also be surveyed.

Management Urgency: M3. Approximately 15 acres of the enclosure are used for grazing experiments. In the past, cattle have escaped from this area into the rest of the enclosure. Appropriate measures must be taken to prevent trespassing. There is evidence of off road vehicle use that originates from an unlocked gate in the southeast fence and continues toward the center of the RNA. RNA boundaries need to be marked and accompanied by some type of interpretative signs that would explain RNA purposes and goals to the public.

Management Needs: Inappropriate and unauthorized uses need to be monitored in order to prevent future problems. The perimeter fence needs to be repaired at stream crossing on the north side, west bound and a lock needs to be placed on the gate that crosses the road to the guard station to help prevent livestock and motor vehicle access. There is no survey marker, in the southeast corner of the RNA. From the west, the perimeter log fence has been built to the southeast corner and then stops. A wire fence looks like it should continue but has not yet been completed. The elk activity should be monitored in order to ensure riparian protection, and the RNA should be inventoried for exotic plant species in the spring and summer months.

Current Landuse:

Onsite: The site is allocated to Management Area 4A-25 lands in the Sawtooth Land and Resource Management Plan. A portion of the site is used for experiments to study the effects of cattle grazing on riparian systems. There was no livestock observed in 1999. In 2000, evidence of sheep entering the RNA from the north to obtain water from the stream was found. Beaver activity was observed in 1999 but not in 2000. Recreational or unauthorized use were not observed.

Offsite: The western, eastern, and southern boundaries are adjacent to Management Area 4A-14 lands, which are lands managed for scenic travel. The northern boundary is adjacent to Management Area 4A-16 lands that are managed to provide a variety of dispersed and developed recreation activities in semi-primitive non-motorized, semi-primitive motorized, and roaded natural recreation settings. In 1999, evidence of grazing was found in the riparian/meadow region just east of the RNA boundary as well as the sage steppe region surrounding the RNA and historic site. In 2000, a sheep herd was observed in the general area of the RNA. Immediately adjacent to the RNA are footpaths, a bridge, restroom facilities, interpretive signs, and other improvements associated with the historic ranger station and visitor's site. Some of these have been vandalized.

Exotic Species Comments: Populations of exotic species have not been documented.

Pests/Pathogens Comments:

Managed Area Comments: The site is wholly within the Sawtooth National Forest, Sawtooth National Recreation Area.

References

- U96RUS09IDUS Rust, S. K., and A. G. Evenden. 1996. Establishment record for Pole Creek Enclosure Research Natural Area within Sawtooth National Forest, Custer County, Idaho. Unpublished report prepared for the U.S. Forest Service Intermountain Research Station, Ogden, UT. 12 pp. plus appendices and maps.
- U88MOS08IDUS Moseley, R. K. 1988. Establishment record for Pole Creek Enclosure Research Natural Area within Sawtooth National Forest, Blaine County, Idaho. USDA Forest Service. Draft.
- F85MOS33IDUS Moseley, R. K. 1985. Site survey summary for Pole Creek Enclosure proposed Research Natural Area, Sawtooth National Forest. 2 pp.
- U82WEL04IDUS Wellner, C. A. 1982. Recommended research natural areas, Sawtooth National Forest. Unpublished report prepared for the U.S. Department of Agriculture, Forest Service, Sawtooth National Forest. 11 pp.
- U72USF01IDUS USDA Forest Service, Intermountain Region. 1972. Ecological description and evaluation - White Cloud, Boulder, and Pioneer Mountains. USDA Forest Service, Intermountain Region, Ogden, UT. 92 pp.
- U72USF02IDUS USDA Forest Service, Intermountain Region. 1972. Ecological description and evaluation - proposed Sawtooth National Recreation and Wilderness Areas. USDA Forest Service, Intermountain Region, Ogden, UT. 96 pp.
- U72GUN01IDUS Gunnell, F., and T. A. Phillips. 1972. Wildlife analysis of the White Cloud, Boulder and Pioneer Mountains. USDA Forest Service, Intermountain Region, Ogden, UT. 110 pp. plus appendices.
- U72PLA01IDUS Platts, W. S. 1972. Aquatic environment and fisheries study - Boulder and Pioneer Mountain areas. USDA Forest Service, Intermountain Region, Ogden, UT. 79 pp.
- U95SNO01IDUS Snook, E. N. 1995. Geomorphic changes in small northern Rocky Mountain streams after domestic livestock exclusion. Unpublished thesis, University of Wyoming. 87 pp.
- U99AUS05IDUS Austin, M. L. 1999. Basic stewardship monitoring data for Pole Creek Enclosure Research Natural Area. Unpublished report prepared for the United States Department of Agriculture, Forest Service, Intermountain Region by Red Willow Research, Burley, Idaho. Not paged.

U00AUS06IDUS Austin, M. L. 2000. Basic stewardship monitoring data for Pole Creek Exclosure Research Natural Area. Unpublished report prepared for the United States Department of Agriculture, Forest Service, Intermountain Region by Red Willow Research, Burley, Idaho. 8 pp. plus appendices.

F02RUS04IDUS Rust, S. K., J. J. Miller, and C. L. Coulter. 2002. Field data sheets for stand inventory and monitoring on Sawtooth National Forest Research Natural Areas. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise. Not paged.

Record Maintenance:
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Idaho Conservation Data Center
Site Record

POLE CANYON
477

Location

Ecoregion Section: NORTHWEST BASIN AND RANGE SECTION (342B)
Watershed: 16020309001
County: Cassia
USGS Quadrangle(s): BLACK PINE PEAK and SWEETZER CANYON

LAT: 420712N S: 420650N E: 1130421W
LONG: 1130449W N: 420735N W: 1130517W

Legal Description (township/range, section, meridian, note)

015S029E 16 BO W2
015S029E 17 BO SE4

Directions: Pole Canyon RNA is located in the Black Pine Mountains of southern Idaho, ca 2 miles (3.2 km) east of Black Pine Peak. From Burley, Idaho, travel east, then southeast, on Interstate 84 for ca 53 miles (86 km) to Juniper Exit. Turn west onto Pole Canyon Road (Forest Service Road 761) and travel west for ca 5.5 miles (8.9 km) to Mill Fork. Turn south and travel to the end of the road. This is the northeastern corner of the RNA.

Imagery: The following aerial photography is available from the Forest Supervisor's Office: 8-7-78, F16, 714141, 278-77.

Site Design

Designer: Van Pelt, N.
Date: 81-08-02

Design Justification: The boundaries were drawn to include as much of the uppermost portion of Mill Fork drainage and to include *Pseudotsuga menziesii* (Douglas-fir), *Abies lasiocarpa* (subalpine fir), *Populus tremuloides* (quaking aspen), and sagebrush-grass communities. The surrounding area has been heavily grazed, which constrains the size of the RNA.

Site Comments: In 1999, Miriam Austin of Red Willow Research conducted stewardship monitoring surveys on 25 June; 2 July; 28 August; 6 September; 31 October; and in 2000 on 26 June; 3, 23 July; 7 August. Observations on current management concerns were recorded. In 2001 on 11 September, Miriam Austin surveyed the RNA to determine if illegal woodcutting activity was continuing and to determine if sheep were being allowed to graze. In 2002, Steve Rust and Jennifer Miller of Idaho Department of Fish and Game, Conservation Data Center conducted stewardship monitoring surveys on 10, 11 October. Species composition and environment relations were documented on 0.1 acre fixed ecological plots (plot id 021010-1425, 021011-1327, and 021011-1442) and stand level point observation ecological plots (plot id 021010-1542). Fixed monitoring plots with tree data were also established (plot id 021010-1614, 021010-1720, and 021010-1809). A plant species list was compiled.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 164.80
Primary Acres: 164.80

Elevation range (feet): 6,640 8,376

Site Description: Pole Canyon RNA lies at the headwaters of Mill Fork, a tributary of Pole Canyon on the east slope of the Black Pine Mountains. The area encompasses two small east-facing drainages. Elevations range from 6,600 feet (2000 m) where Mill Fork leaves the area to 8,376 feet (2538 m) on the peak at the southwest corner. The vegetation is comprised of coniferous forest habitat types in the *Pseudotsuga menziesii* and *Abies lasiocarpa* climax series two *Populus tremuloides* community types, and non-forest associations that fall into three climax sagebrush series. *Pediocactus simpsonii* var. *robustior* (snowball cactus), a plant species of concern also occurs within the area.

Key Environmental Factors:

Climate: The climate of the area is controlled largely by continental and Gulf of Mexico weather systems resulting in low annual precipitation that is dispersed somewhat evenly throughout the year. A slight precipitation peak occurs in May and June. Influx of moisture-laden air originating in the Gulf of Mexico results in considerable thunderstorm activity during the summer.

Landuse History: The site has a history of sheep grazing. Limited cutting of large *Pseudotsuga menziesii* occurred many years ago in the valley bottom at the northeastern corner of the area.

Cultural Features: There are no known presettlement cultural features within the site.

Element Occurrences (element/size/occurrence type):

ABIES LASIOCARPA/CAREX GEYERI	1*
ABIES LASIOCARPA/BERBERIS REPENS	1*
ABIES LASIOCARPA/OSMORHIZA CHILENSIS	1*
ABIES LASIOCARPA/THALICTRUM OCCIDENTALE	1*
PSEUDOTSUGA MENZIESII/ACER GLABRUM	31*
PSEUDOTSUGA MENZIESII/OSMORHIZA CHILENSIS	31*
POPULUS TREMULOIDES/AMELANCHIER ALNIFOLIA-SYMPHORICARPOS OREOPHILUS/CALAMAGROSTIS RUBESCEN	10
ARTEMISIA TRIDENTATA VASEYANA/BROMUS CARINATUS	
ARTEMISIA TRIDENTATA VASEYANA/LEUCOPOA KINGII	5
ARTEMISIA TRIDENTATA VASEYANA/AGROPYRON SPICATUM	
ARTEMISIA TRIDENTATA VASEYANA-SYMPHORICARPOS OREOPHILUS/AGROPYRON SPICATUM	

ARTEMISIA NOVA/AGROPYRON SPICATUM	
PSEUDOTSUGA MENZIESII/Berberis repens, Carex Geyeri Phase	31*
ARTEMISIA TRIDENTATA SPICIFORMIS/Carex Geyeri	
ARTEMISIA FRIGIDA/AGROPYRON SPICATUM	5
PEDIOCACTUS SIMPSONII	

Biodiversity Significance:

Other Values:

Protection and Stewardship
Designation: RESEARCH NATURAL AREA

Protection Urgency: P3. The area is an established RNA.

Information Needs: Plant inventory was taken in the following plant association types: Pseudotsuga menziesii/Berberis repens (Mahonia repens)-Carex Geyeri (elk sedge), Artemisia tridentata ssp. vaseyana (mountain big sagebrush)-Symphoricarpos oreophilus (mountain snowberry)/Agropyron spicatum (bluebunch wheatgrass), Artemisia tridentata ssp. vaseyana/Leucopoa kingii (spike fescue), Artemisia frigida (prairie sagewort)/Agropyron spicatum. However, more plant community inventory is needed to verify element occurrences as well as inventory surveys to identify the flora and fauna present.

Management Urgency: M3. Trespass grazing is a potential problem. Motor vehicle access should be denied on the road/trail that enters the RNA from the northeastern corner. There is also evidence of recent firewood cutting in this area.

Management Needs: The RNA and other areas of Mill Fork should not be opened to the public for firewood gathering. There is a need to control access and increase law enforcement in order to eliminate illegal grazing and timber/firewood harvesting within the RNA. Protective and interpretive signage about the RNA has been destroyed on the northeastern corner of the RNA. The road/trail from the northeastern corner should be blocked to insure no motor vehicle access.

Current Landuse:

Onsite: Pole Canyon is listed as an established RNA and allocated to Management Area 1K lands in the Sawtooth National Forest Land and Resource Management Plan. The site is within a grazing allotment but is closed to grazing. In 1999, heavy grazing and browsing by sheep was observed in the lower portions of the RNA. Woodcutting also occurred within the lower tip of the RNA. Evidence of litter, vegetation destruction, and spray paint graffiti was reported in the area. In 2000, illegal woodcutting on portions of Mill Fork immediately adjacent to the area and on the northern portion of the RNA was reported.

Offsite: The site is surrounded by Forest Service lands within Management Area 1J-2 lands, which are scenic travel routes. In 1999 and 2000, timber salvage and illegal/improper firewood/timber harvest occurred adjacent to the RNA and immediately down canyon. This altered the visual or aesthetic appearance of the approach to and at the beginning of the RNA. A sheep camp was set up in Mill Fork ca 0.5 mile below the RNA.

Exotic Species Comments: Populations of exotic species have not been documented.

Pests/Pathogens Comments: Some of the Pseudotsuga menziesii in the area are seriously infected with Arceuthobium douglasii (dwarf-mistletoe). The RNA and adjacent areas have suffered extensive beetle kill in recent infestations (Austin 1999).

Managed Area Comments:

References

- U96RUS10IDUS Rust, S. K., and A. G. Evenden. 1996. Establishment record for Pole Canyon Research Natural Area within Sawtooth National Forest, Cassia County, Idaho. Unpublished report prepared for the U.S. Forest Service Intermountain Research Station, Ogden, UT. 15 pp. plus appendices and maps.
- U82WEL04IDUS Wellner, C. A. 1982. Recommended research natural areas, Sawtooth National Forest. Unpublished report prepared for the U.S. Department of Agriculture, Forest Service, Sawtooth National Forest. 11 pp.
- U87MOS17IDUS Moseley, R. K. 1987. Establishment record for Pole Canyon Research Natural Area on the Sawtooth National Forest, Cassia County, Idaho. USDA Forest Service. Draft.
- U99AUS02IDUS Austin, M. L. 1999. Basic stewardship monitoring data for Pole Canyon Research Natural Area. Unpublished report prepared for the United States Department of Agriculture, Forest Service, Intermountain Region by Red Willow Research, Burley, Idaho. Not paged.
- U00AUS02IDUS Austin, M. L. 2000. Basic stewardship monitoring data for Pole Canyon Research Natural Area. Unpublished report prepared for the United States Department of Agriculture, Forest Service, Intermountain Region by Red Willow Research, Burley, Idaho. 10 pp. plus appendices.
- U02AUS03IDUS Austin, M. L. 2002. Basic stewardship monitoring data for Pole Canyon Research Natural Area. Unpublished report prepared for the United States Department of Agriculture, Forest Service, Intermountain Region by Red Willow Research, Twin Falls, Idaho. 12 pp. plus appendices.
- F02RUS04IDUS Rust, S. K., J. J. Miller, and C. L. Coulter. 2002. Field data sheets for stand inventory and monitoring on Sawtooth National Forest Research Natural Areas. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise. Not paged.

Record Maintenance:
Edition: 96-08-28, A. H. Pitner
This report was printed on 03-06-03.

Idaho Conservation Data Center
Site Record

HUCKLEBERRY CREEK FEN
581

Location

Ecoregion Section: IDAHO BATHOLITH SECTION (M332A)
Watershed: 17060201156
County: Custer
USGS Quadrangle(s): MT. CRAMER and OBSIDIAN

LAT: 440330N S: 440312N E: 1145223W
LONG: 1145236W N: 440347N W: 1145257W

Legal Description (township/range, section, meridian, note)

008N013E 01 BO unsurveyed
009N013E 36 BO unsurveyed
009N014E 31 BO SW4NW4SW4, W2SW4SW4

Directions: Huckleberry Creek Fen is located ca 9 air miles south of Stanley, Idaho, on the west side of Decker Flat. From Stanley, travel ca 16 miles south on Highway 75 to Forest Service Road 209. Turn west on Forest Service Road 209 for ca 0.25 mile across the Salmon River to the intersections of Forest Service Road 210 (Decker Flat Road) and Forest Service Road 315 (Hell Roaring Creek). Travel ca 2 miles north on Forest Service Road 210. A road heads due west, that can be traveled, until it ends at a fence corner. Walk from the fence corner ca 0.5 mile to the RNA.

Imagery:

Site Design

Designer: Jankovsky-Jones, M.
Date: 02-04-04
Design Justification: Boundaries follow the outer edges of the fen.

Site Comments: On 30 August 2002, Steve Rust, Jennifer Miller, and Cyndi Coulter visited the area during an Idaho Conservation Data Center stewardship monitoring survey.

Biological and Physical Characteristics

Size. Primary and Secondary Acres:

Primary Acres:

Elevation range (feet): 6660 -

Site Description: Huckleberry Creek Fen is a sloped wetland between the moraines of Hell Roaring and Decker creeks. The fen is a very complex mosaic of community types that extend over short distances. The most widespread community is *Pinus contorta/Vaccinium occidentale* (lodgepole pine/blue huckleberry). Small microsites (up to 10 x 10 meters) support near monocultures of *Carex utriculata* (bladder sedge), *Eleocharis pauciflora* (few-flowered spikerush), *Carex livida* (pale sedge), *Scirpus cespitosus* (tufted bulrush), and *Betula glandulosa* (bog birch). These small stands are created as inclusion within the *Pinus contorta/Vaccinium occidentale* plant community.

Key Environmental Factors: The sloped wetland occurs in an area subirrigated by groundwater, which presumably originates as precipitation on porous glacial till upslope. The wetland sits in a small valley created by the moraines of Decker and Hell Roaring creeks. Huckleberry Creek originates above the peatland and transverses the area. It should be noted that Huckleberry Creek is a spring creek and not driven by melt of high elevation snow pack.

Climate:

Landuse History:

Cultural Features:

Element Occurrences (element/size/occurrence type):

PINUS CONTORTA/VACCINIUM OCCIDENTALE	70 +
DROSERIA INTERMEDIA	10 AC
CAREX BUXBAUMII	5 AC
CAREX LIVIDA	20 AC

Biodiversity Significance: B1

The fen provides habitat for several peatland species of concern including *Carex livida*, *C. Buxbaumii* (Buxbaum's sedge), and *Drosera intermedia* (spoon-leaved sundew). The spring creeks are important rearing areas for steelhead and Chinook salmon. The creeks provide a continual source of cool water throughout the growing season in most years.

Other Values:

Protection and Stewardship

Designation: RESEARCH NATURAL AREA

Protection Urgency: P3. Adjacent private lands could be the focus of future conservation efforts.

Information Needs: Plant community inventory is needed to verify element occurrences as well as surveys to identify the

flora and fauna present. Fish inventories are also needed.

Management Urgency: M1. Livestock are grazing within the site. A fence needs to be constructed to prevent entry from Decker Flat. Monitoring plots should be re-evaluated to assess changes since 1993. In 2002, there is still signs of livestock, pugging, grazing and trails, within the boundaries of the RNA.

Management Needs: Decker Flat is grazed and livestock had entered the RNA in 2001 and previous years. Impacts include compacted trails, pugging in emergent habitat, and removal of aboveground biomass. The effect on the fen includes loss of vegetative cover in trails, creation of hummocky topography, increase run-off rather than storage of water, and possibly changes in water quality from nutrient inputs (fecal material), and alteration of filtering functions. A fence needs to be constructed to prevent livestock use. As of 2002, no fence has been constructed. However, protective and interpretive signs, about the RNA, and a perimeter fence should be installed.

Current Landuse:

Onsite:

Offsite:

Exotic Species Comments: Exotics, which threaten site quality, were not observed.

Pests/Pathogens Comments:

Managed Area Comments: Sawtooth Valley Peatlands RNA is composed of three separate peatlands of which Huckleberry Creek Fen is the middle peatland.

References

- F01JAN12IDUS Jankovsky-Jones, M. and C. Murphy. 2001. Field notes for Huckleberry Creek Fen (S.USIDHP*581). 1 page plus map.
- F01JAN03IDUS Jankovsky-Jones, M. and C. Murphy. 2001. Field notes for high valleys of the Salmon River Basin wetland and west central wetland sites
- U94MOS02IDUS Moseley, R. K., R. J. Bursik, F. W. Rabe, and L. D. Cazier. 1994. Peatlands of the Sawtooth Valley, Custer and Blaine Counties, Idaho. Cooperative Cost Share Project, Sawtooth National Forest, The Nature Conservancy, and Idaho Conservation Data Center, Idaho Department of Fish and Game. SNF Purchase Order No. 40-0267-3-0233. 64 pp. plus appendices.
- F02RUS04IDUS Rust, S. K., J. J. Miller, and C. L. Coulter. 2002. Field data sheets for stand inventory and monitoring on Sawtooth National Forest Research Natural Areas. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise. Not paged.

Record Maintenance:

Edition: 02-04-08, M. Jankovsky-Jones

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Idaho Conservation Data Center
Site Record

BULL MOOSE FEN
582

Location

Ecoregion Section: IDAHO BATHOLITH SECTION (M332A)
Watershed: 17060201154
County: Custer
USGS Quadrangle(s): MT. CRAMER and OBSIDIAN

LAT: 440448N S: 440443N E: 1145218W
LONG: 1145233W N: 440503N W: 1145304W

Legal Description (township/range, section, meridian, note)

009N013E 25 BO unsurveyed
009N014E 30 BO S2SW4NW4

Directions: Bull Moose Fen is located in the Sawtooth Valley ca 7 air miles south of Stanley, Idaho. From Stanley, travel south ca 16 miles on Highway 75 to Forest Service Road 209. Travel west on Forest Service Road 209 ca 0.25 mile to the intersection of Forest Service Road 210 (Decker Flat Road) and Forest Service 315 (Hell Roaring Creek Road). Turn north and travel ca 4 miles on Decker Flat Road. Park just after the bridge that crosses Huckleberry Creek and walk up the small creek that drains Bull Moose Fen for ca 0.25 mile to reach the eastern edge of the RNA.

Imagery:

Site Design

Designer: Jankovsky-Jones, M.
Date: 02-04-04
Design Justification: Boundaries follow the outer edges of the fen.

Site Comments: On 30 August 2002, Steve Rust, Jennifer Miller, and Cyndi Coulter visited the area during an Idaho Conservation Data Center stewardship monitoring survey.

Biological and Physical Characteristics

Size. Primary and Secondary Acres:

Primary Acres:

Elevation range (feet): 6640 -

Site Description: Bull Moose Fen is a sloped wetland located between the moraines of Decker and Red Fish Lake creeks. Standing dead and live *Pinus contorta*/*Vaccinium occidentale* (lodgepole pine/blue huckleberry) are present throughout the fen. There is considerable variation in the understory species. *Vaccinium occidentale* is constant although other shrubs such as *Betula glandulosa* (bog birch), *Pentaphylloides floribunda* (shrubby cinquefoil), *Salix wolfii* (Wolf's willow), or *S. planifolia* (planeleaf willow) or graminoids including *Deschampsia cespitosa* (tufted hairgrass), *Carex utriculata* (bladder sedge), or *Calamagrostis canadensis* (bluejoint reedgrass) may be locally dominant. The southern arm of the fen has a high gradient (greater than a 5% slope). This area includes a peat terrace that is 20 to 30 feet higher than the adjacent fen and contains the source of spring fed rivulets that cascade down the face. In addition, the southern arm is more diverse and includes somewhat continuous stands of *Eleocharis pauciflora* (few-flowered spikerush) with lesser amounts of *Scirpus cespitosus* (tufted bulrush). *Carex utriculata* also creates large stands, but close inspection of most stands, reveals high cover of *Salix wolfii*, *S. planifolia*, and *Betula glandulosa*. Small patches of *Carex simulata* (short-beaked sedge) and *Deschampsia cespitosa* were also noted but considered inclusions within other communities. A small area of open water in an ancient beaver dam is present and its outlet supports a small stand of *Salix geeyeriana*/*Calamagrostis canadensis* (Geyer willow/bluejoint reedgrass). The northern arm of the fen also contains small patches of *Salix geeyeriana*; but for the most part, it is dominated by *Pinus contorta*/*Vaccinium occidentale*.

Key Environmental Factors: The sloped wetland occurs in an area that is subirrigated by groundwater, which presumably originates as precipitation on porous glacial till upslope. The wetland sits in a small valley created by the moraines of Decker Creek and Red Fish Lake.

Climate:

Landuse History:

Cultural Features:

Element Occurrences (element/size/occurrence type):

PINUS CONTORTA/VACCINIUM OCCIDENTALE	30
SALIX GEYERIANA/CALAMAGROSTIS CANADENSIS	5
SALIX WOLFII/CAREX UTRICULATA	20
CAREX UTRICULATA	5
ELEOCHARIS PAUCIFLORA	3

Biodiversity Significance: B1

Bull Moose Fen is a largely undisturbed high quality peatland complex. The spring creeks are important rearing areas for steelhead and Chinook salmon, and, in most years, provide a continual source of cool water throughout the growing season.

Other Values:

Protection and Stewardship
Designation: RESEARCH NATURAL AREA

Protection Urgency: P5. The area is within the Sawtooth Valley Peatlands RNA.

Information Needs: Plant community inventory is needed to verify element occurrences as well as surveys to identify the flora and fauna present.

Management Urgency: M4. Permanent monitoring should be established here following methods used at other peatlands within the Sawtooth Valley Peatlands RNA.

Management Needs: Evidence of livestock use was noted just outside the southern and northern boundaries of the RNA. No sign was observed inside the RNA even though there are no real barriers to livestock entry.

Current Landuse:

Onsite:

Offsite: Off-site considerations were not noted.

Exotic Species Comments: Small amounts of *Poa pratensis* (Kentucky bluegrass), *Poa palustris* (fowl bluegrass), *Phleum pratense* (timothy), and *Taraxacum officinale* (common dandelion) were observed. Often the exotics were present in areas where ground was disturbed by beaver activity. The exotics do not appear to be problematic at the present time.

Pests/Pathogens Comments:

Managed Area Comments: Sawtooth Valley Peatlands RNA is composed of three separate peatlands of which Bull Moose Fen is the northern peatland.

References

- F01JAN13IDUS Jankovsky-Jones, M. and C. Murphy. 2001. Field notes for Bull Moose Fen (S.USIDHP*582). 1 page plus map.
- F01JAN03IDUS Jankovsky-Jones, M. and C. Murphy. 2001. Field notes for high valleys of the Salmon River Basin wetland and west central wetland sites
- U94MOS02IDUS Moseley, R. K., R. J. Bursik, F. W. Rabe, and L. D. Cazier. 1994. Peatlands of the Sawtooth Valley, Custer and Blaine Counties, Idaho. Cooperative Cost Share Project, Sawtooth National Forest, The Nature Conservancy, and Idaho Conservation Data Center, Idaho Department of Fish and Game. SNF Purchase Order No. 40-0267-3-0233. 64 pp. plus appendices.

Record Maintenance:

Edition: 02-04-08, M. Jankovsky-Jones
This report was printed on 03-06-03.

Idaho Conservation Data Center
Site Record

MAYS CREEK FEN
580

Location

Ecoregion Section: IDAHO BATHOLITH SECTION (M332A)
Watershed: 17060201075
County: Custer
USGS Quadrangle(s): OBSIDIAN

LAT: 440105N S: 440053N E: 1145057W
LONG: 1145109W N: 440116N W: 1145135W

Legal Description (township/range, section, meridian, note)
008N014E 17,18 BO

Directions: Mays Creek Fen is located in the Sawtooth Valley between the moraines of Yellow Belly Lake and Hell Roaring Creek. From Stanley, Idaho, travel 16 miles south on State Highway 75. Travel west on Forest Service Road 209 ca 0.5 mile across the Salmon River to the intersections of Forest Service Road 210(Decker Flat Road) and 315 (Hell Roaring Creek Road). Turn west on Forest Service Road 210 for ca 1 mile to reach the northern side of the fens.

Imagery:

Site Design

Designer: Murphy, C., and M. Jankovsky-Jones
Date: 02-04-04

Design Justification: On the north, west, and south the RNA boundary follows the edge of the fen; it does not include any upland habitats. On the east it follows the boundary between private land and National Forest.

Site Comments:

Biological and Physical Characteristics

Size. Primary and Secondary Acres:
Primary Acres:

Elevation range (feet): 6800 -

Site Description: Mays Creek Fen is located between the moraines of Yellow Belly Lake and Hell Roaring Creeks. The area includes the sloped wetlands associated with springs and the low gradient channel of Mays Creek. The fen includes tall *Salix geeyeriana* (Geyer's willow) dominated wetlands as Mays Creek enters the flat valley bottom. Semipermanently saturated mid-slopes of the wetland support a mosaic of *Scirpus cespitosus* (tufted bulrush), *Eleocharis pauciflora* (few-flowered spikerush), *Carex utriculata* (beaked sedge), *Salix planifolia* (planeleaf willow) and islands of *Pinus contorta* (lodgepole pine) with high cover of *Vaccinium occidentale* (blue huckleberry) and *Betula glandulosa* (bog birch) in the understory. Mays Creek enters a well-defined channel through well-drained wetlands dominated by *Salix wolfii* (Wolf's willow) and *Deschampsia cespitosa* (tufted hairgrass) at the lower end of the wetland and near the eastern boundary of the RNA. Just outside this boundary, stands of *Artemisia cana* (silver sage) were also observed.

Key Environmental Factors: The sloped wetland occurs on areas that are subirrigated by springs with groundwater presumably originating as precipitation on the porous glacial till upslope. The fen occurs between the moraines of Yellow Belly Lake and Hell Roaring Creek.

Climate:

Landuse History:

Cultural Features:

Element Occurrences (element/size/occurrence type):

PINUS CONTORTA/CALAMAGROSTIS CANADENSIS	10
PINUS CONTORTA/VACCINIUM OCCIDENTALE	30
SALIX GEYERIANA/CALAMAGROSTIS CANADENSIS	2 +-
SALIX PLANIFOLIA MONICA/CAREX AQUATILIS-CAREX UTRICULATA	1
SALIX WOLFII/DESCHAMPSIA CESPITOSA	5
ELEOCHARIS PAUCIFLORA	3
SCIRPUS CESPITOSUS-CAREX LIVIDA	40
HELODIUM BLANDOWII	
DROSERA INTERMEDIA	40 AC
EPILOBIUM PALUSTRE	
CAREX BUXBAUMII	10 SQ M
CAREX LIVIDA	40 AC

Biodiversity Significance:

Mays Creek provides important rearing habitat for Chinook and steelhead salmon. The spring creeks provide a continual source of cool water throughout the growing season. The fen provides habitat for three plant species of concern including one of known populations of *Drosera intermedia* (spoon-leaved sundew).

Other Values:

Protection and Stewardship
Designation: RESEARCH NATURAL AREA

Protection Urgency: .

Information Needs: Plant community inventory is needed to verify element occurrences as well as surveys to identify the flora and fauna present.

Management Urgency: .

Management Needs:

Current Landuse:

Onsite:

Offsite:

Exotic Species Comments: No exotic species were noted which threaten the site's viability.

Pests/Pathogens Comments:

Managed Area Comments: The Sawtooth Valley Peatlands RNA is composed of three separate peatlands of which Mays Creek Fen is the southern peatland.

References

- F01MUR05IDUS Murphy, C. and M. Jankovsky-Jones. 2001. Field notes for Mays Creek Fen (S.USIDHP*580). 2 pp. plus map.
- F01JAN03IDUS Jankovsky-Jones, M. and C. Murphy. 2001. Field notes for high valleys of the Salmon River Basin wetland and west central wetland sites
- U94MOS02IDUS Moseley, R. K., R. J. Bursik, F. W. Rabe, and L. D. Cazier. 1994. Peatlands of the Sawtooth Valley, Custer and Blaine Counties, Idaho. Cooperative Cost Share Project, Sawtooth National Forest, The Nature Conservancy, and Idaho Conservation Data Center, Idaho Department of Fish and Game. SNF Purchase Order No. 40-0267-3-0233. 64 pp. plus appendices.

Record Maintenance:

Edition: 02-04-09, M. Jankovsky-Jones
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Idaho Conservation Data Center
Site Record

SAWTOOTH VALLEY PEATLANDS
495

Location

Ecoregion Section: IDAHO BATHOLITH SECTION (M332A)
Watershed: 17060201075, 17060201154 and 17060201156
County: Custer
USGS Quadrangle(s): MT. CRAMER and OBSIDIAN

LAT: 440330N S: 440053N E: 1145057W
LONG: 1145236W N: 440503N W: 1145304W

Legal Description (township/range, section, meridian, note)

008N013E	01	BO	NE4; unsurveyed
008N014E	17,18	BO	
009N013E	25,36	BO	
009N014E	30,31	BO	

Directions: All three units of the Sawtooth Valley Peatlands are accessible, by sedan, in the snow free season.

Directions to all units begin at the intersection of Forest Service Roads 210 (Decker Flat Road) and 315 (Hell Roaring Creek Road), which is reached by turning west off State Highway 75, 16 miles south of Stanley, Idaho, and proceeding 0.25 mile across the Salmon River bridge to the intersection (see map). Mays Creek unit is reached by proceeding west on Forest Service Road 315 for ca 1 mile to the northern edge of the Mays Creek Fen. Huckleberry Creek unit is reached by proceeding north on Forest Service Road 210 for ca 2 miles to the intersection of an unnumbered dirt road that heads west along the line common to Sections 6, T8N R14E and Section 31, T9N R14E. Proceed along this road, which eventually parallels a fence line, for ca 1 mile to the end of the fence. The Huckleberry Creek Fen eastern boundary is a short walk west across the meadow. To reach the Bull Moose unit, follow Forest Service Road 210 north, similar to the directions for Huckleberry Creek, except continue for ca 2 miles to where the road crosses Decker Creek. Park on the north side of the creek and proceed due west on the north side of a small unnamed creek for ca 0.2 mile to the eastern edge of Bull Moose Fen.

Imagery: The following true-color aerial photos, taken in August 1977, provide coverage of the Sawtooth Valley Peatlands area: Mays Creek unit (F16 ST 16037 877 11), Huckleberry Creek unit (F16 ST 16037 1277 93), and the Bull Moose unit (ST 16037 1277 95). They are located at Sawtooth National Forest, Stanley Ranger District.

Site Design

Designer: Moseley, R. K.
Date: 94-05-18

Design Justification: Boundaries of the three units follow the edge of the fen (edge of the peat substrate) and are the same as the RNA.

Site Comments: In 2002, Steve Rust, Jennifer Miller, and Cyndi Coulter conducted an Idaho Conservation Data Center stewardship monitoring survey of Bull Moose Fen and Huckleberry Creek Fen.

Biological and Physical Characteristics

Size. Primary and Secondary Acres: 295.60
Primary Acres: 295.60

Elevation range (feet): 6640 -

Site Description: Sawtooth Valley Peatlands is comprised of three peatlands that lie at the east base of the Sawtooth Range in the Sawtooth Valley of central Idaho. The three peatlands are relatively small ranging in size from 34 to 80 ha and lie in close proximity to one another at the western edge of the Sawtooth Valley. They are similar in that the organic substrates are greater than 12 inches thick, yet each is different from the others, and together they encompass much of the range of diversity of peatland habitats in the Sawtooth Valley. All three fens have high community diversity and a mosaic of types. Mays Creek Fen has excellent and extensive examples of the rare *Scirpus cespitosus*-*Carex livida* (tufted bulrush-pale sedge) type and somewhat less of the *Carex buxbaumii* (Buxbaum's sedge) type. Other types include *Pinus contorta*/*Vaccinium occidentale* (lodgepole pine/blue huckleberry), *Carex utriculata* (bladder sedge) and *Eleocharis pauciflora* (few-flowered spikerush). Huckleberry Creek Fen contains excellent examples of the rare *S. cespitosus*-*C. livida* and *C. buxbaumii* types. The coverage area of *C. buxbaumii* type is similar in size to Mays Creek, while the *S. cespitosus*-*C. livida* covers less area. The unique feature of Huckleberry Creek Fen is that *S. cespitosus*-*C. livida* and *E. pauciflora* types occur on steeper slopes and have deeper peat deposits than at Mays Creek, a situation that intuitively seems like it should be reversed. Other types at Huckleberry Creek include *P. contorta*/*V. occidentale*, *C. utriculata*, *Salix geyeriana*/*C. utriculata* (Geyer's willow/bladder sedge), *Betula glandulosa* (bog birch), *Deschampsia cespitosa* (tufted hairgrass), and *Carex simulata* (short-beaked sedge). At Bull Moose Fen, each community type covers more continuous areas than the other two units. There is an extensive, continuous area containing a mosaic of *S. cespitosus* and *E. pauciflora* on moderate slopes. Other types of at Bull Moose Fen include *P. contorta*/*V. occidentale*, *C. utriculata*, *S. geyeriana*/*C. utriculata* (Drummond's willow/bladder sedge), *B. glandulosa*, *D. cespitosa*, and *C. simulata*. A unique feature of Bull Moose Fen is the peat terrace that occurs along the southern boundary. The terrace is 20-30 feet (6.1-9.1 m) higher than the adjacent part of the fen and contains the source of several spring-fed rivulets that cascade down the face.

Key Environmental Factors:

Climate: Winters in the area are influenced by Pacific Maritime weather systems. The period from late fall

through the early spring months is moist and warmer than might be expected for mountainous country. Periodically the Pacific weather systems are interrupted by cold, dry systems from Canada. Continental climatic conditions prevail in the summer months resulting in low precipitation and relative humidity. Daily temperature variation can be 40 degrees F to 50 degrees F (22 degrees C to 28 degrees C) or more.

Landuse History: The site does not have a history of mining, grazing, or timber harvest.

Cultural Features: There are no presettlement cultural features known from the site.

Element Occurrences (element/size/occurrence type):

Biodiversity Significance: B1

Spring creeks provide important spawning and rearing habitat for chinook and steelhead salmon. The creeks provide source of cool water throughout the growing season in most years. High diversity of peatland communities occurring in a small-scale mosaic includes the rare *Scirpus cespitosus*-*Carex livida*, *Carex buxbaumii*, and *Pinus contorta*/*Vaccinium occidentale* types. Rare vascular and bryophyte species also occur within the peatlands, including *Drosera intermedia* (spoon-leaved sundew), *Epilobium palustre* (swamp willow-weed), *Carex buxbaumii*, *Carex livida*, and *Helodium blandowii* (Blandow's helodium).

Other Values:

Numerous springs and spring-creeks occur within the site. All three units indicate high water quality in the streams; Chinook salmon use lower Mays Creek for spawning. Mays Creek was used as a study site for research on stream bottom communities by Tuhy and Jensen in the late 1970's and early 1980's. Permanent ecological monitoring stations are established at two sites and baseline data has been collected.

Protection and Stewardship

Designation: RESEARCH NATURAL AREA

Protection Urgency: P5. The area was formally established as an RNA in 1996.

Information Needs:

Management Urgency: M4.

Management Needs:

Current Landuse:

Onsite: Some livestock may venture into the site but typically avoid entering the peat substrate.

Offsite: Most of the surrounding lands fall within Management Area 4A, the Sawtooth NRA. Some private holdings are adjacent or nearby to the east of the three units while the Sawtooth Wilderness lies a short distance to the west. The primary use of the Management Area is recreation, but grazing may occur on some of the adjacent land.

Exotic Species Comments: Populations of exotic species have not been documented.

Pests/Pathogens Comments:

Managed Area Comments: The site is within the Sawtooth National Recreation Area.

References

- F02RUS04IDUS Rust, S. K., J. J. Miller, and C. L. Coulter. 2002. Field data sheets for stand inventory and monitoring on Sawtooth National Forest Research Natural Areas. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise. Not paged.
- B98CHA01IDUS Chadde, S. W., et al. 1998. Peatlands on national forests of the northern Rocky Mountains: ecology and conservation. USDA Forest Service General Technical Report RMRS-GTR-11. Rocky Mountain Research Station. Ogden, UT. 75 pp.
- U94MOS02IDUS Moseley, R. K., R. J. Bursik, F. W. Rabe, and L. D. Cazier. 1994. Peatlands of the Sawtooth Valley, Custer and Blaine Counties, Idaho. Cooperative Cost Share Project, Sawtooth National Forest, The Nature Conservancy, and Idaho Conservation Data Center, Idaho Department of Fish and Game. SNF Purchase Order No. 40-0267-3-0233. 64 pp. plus appendices.
- U94MOS08IDUS Moseley, R. K. 1994. Establishment record for Sawtooth Valley Peatlands Research Natural Area within Sawtooth National Forest, Custer County, Idaho. Unpublished report prepared for the Sawtooth National Forest. 21 pp. plus appendices.
- U82TUH01IDUS Tuhy, J. S., and S. Jensen. 1982. Riparian classification for the Upper Salmon/Middle Fork Salmon River drainages, Idaho. White Horse Associates, Smithfield, UT. 183 pp.
- U81TUH01IDUS Tuhy, J. S. 1981. Stream bottom community classification for the Sawtooth Valley, Idaho. Unpublished thesis, University of Idaho, Moscow. 230 pp.
- U72USF02IDUS USDA Forest Service, Intermountain Region. 1972. Ecological description and evaluation - proposed Sawtooth National Recreation and Wilderness Areas. USDA Forest Service, Intermountain Region, Ogden, UT. 96 pp.
- D96MOS01IDUS Moseley, R., and A. Evenden. 1996. Establishment record for Sawtooth Valley Peatlands Research Natural Area, Sawtooth National Forest, Custer County, Idaho. 29 pp. plus appendices.

Record Maintenance:

Edition: 96-08-28, A. H. Pitner

This report was printed on 03-06-03.

Appendix C. Plant species lists. Updated plant species lists for Basin Gulch, Mount Harrison, Pole Canyon, Pole Creek Exclosure, Redfish Lake Moraine, and Trapper Creek research natural areas are shown on the pages that follow.

BASIN GULCH Vascular Plant Species List

Vascular plant species reported by Chuck Wellner and Bob Moseley on July 23, 1987 and Steve Rust and Jennifer Miller on October 15, 2002 are listed alphabetically by physiognomic class. Nomenclature follows Hitchcock and Cronquist (1973) for the most part.

Trees

<i>Abies lasiocarpa</i>	subalpine fir
<i>Pinus albicaulis</i>	whitebark pine
<i>Pinus flexilis</i>	limber pine
<i>Pseudotsuga menziesii</i>	Douglas-fir

Shrubs

<i>Artemisia tridentata vaseyana</i>	mountain big sagebrush
<i>Chrysothamnus viscidiflorus</i>	green rabbit-brush
<i>Haplopappus macronema</i>	discoid goldenweed
<i>Haplopappus suffruticosus</i>	shrubby goldenweed
<i>Holodiscus dumosus</i>	ocean spray
<i>Juniperus communis</i>	comm on juniper
<i>Potentilla fruticosa</i>	shrubby cinquefoil
<i>Purshia tridentata</i>	antelope bitterbrush
<i>Ribes lacustre</i>	swamp gooseberry
<i>Ribes montigenum</i>	mountain gooseberry
<i>Ribes viscosissimum</i>	sticky currant
<i>Salix</i> sp.	willow
<i>Symphoricarpos oreophilus</i>	mountain snowberry

Herbs

<i>Agoseris aurantiaca</i>	orange agoseris
<i>Anemone multifida</i>	Pacific anemone
<i>Angelica roseana</i>	Rose's angelica
<i>Antennaria alpina</i>	alpine pussy-toes
<i>Antennaria microphylla</i>	rosy pussytoes
<i>Antennaria racemosa</i>	raceme pussytoes
<i>Aquilegia formosa</i>	red columbine
<i>Arabis lemmonii</i>	Lemmon's rockcress
<i>Arabis lyallii</i>	Lyall's rockcress
<i>Arabis microphylla</i>	littleleaf rockcress
<i>Arenaria</i> sp.	sandwort
<i>Arenaria aculeata</i>	needleleaf sandwort
<i>Arenaria nuttallii</i>	Nuttall's sandwort
<i>Arnica cordifolia</i>	heart-leaved arnica
<i>Arnica latifolia</i>	mountain arnica
<i>Arnica longifolia</i>	seep-spring arnica
<i>Artemisia michauxiana</i>	Michaux's wormwood
<i>Aster foliaceus apricus</i>	leafy aster
<i>Balsamorhiza sagittata</i>	arrowleaf balsamroot
<i>Calochortus eurycarpus</i>	wide-fruit mariposa
<i>Castilleja miniata</i>	giant red Indian paintbrush
<i>Cerastium</i> sp.	mouse-ear chickweed
<i>Chaenactis alpina</i>	alpine dustymaiden
<i>Chaenactis evermannii</i>	Evermann's chaenactis
<i>Cirsium tweedyi</i>	Eaton's thistle
<i>Collinsia parviflora</i>	small-flowered blue-eyed Mary

<i>Collomia debilis</i>	alpine collomia
<i>Crepis modocensis</i>	Modoc hawksbeard
<i>Crepis nana</i>	dwarf alpine hawksbeard
<i>Cymopterus hendersonii</i>	Henderson's wavewing
<i>Delphinium</i> sp.	larkspur
<i>Dodecatheon</i> sp.	shootingstar
<i>Epilobium alpinum</i>	alpine willow-herb
<i>Epilobium angustifolium</i>	fireweed
<i>Erigeron asperugineus</i>	Idaho fleabane
<i>Erigeron caespitosus</i>	
<i>Erigeron compositus</i>	cut-leaved daisy
<i>Erigeron peregrinus</i>	wandering fleabane
<i>Erigeron tweedyi</i>	Tweedy's fleabane
<i>Eriogonum ovalifolium</i>	cushion buckwheat
<i>Eriogonum umbellatum</i>	sulfur flower
<i>Erysimum asperum</i>	western wallflower
<i>Fragaria vesca</i>	wild strawberry
<i>Frasera speciosa</i>	elkweed
<i>Galium multiflorum subalpinum</i>	shrubby bedstraw
<i>Gilia aggregata</i>	scarlet gilia
<i>Hackelia</i> sp.	stickseed
<i>Haplopappus acaulis</i>	stemless mock goldenweed
<i>Heuchera cylindrica</i>	roundleaf alumroot
<i>Hieracium albertinum</i>	western hawkweed
<i>Hulsea algida</i>	Pacific hulsea
<i>Lesquerella occidentalis</i>	western bladderpod
<i>Lewisia pygmaea</i>	dwarf lewisia
<i>Linanthastrum nuttallii</i>	Nuttall's linanthastrum
<i>Linum perenne</i>	blue flax
<i>Lomatium idahoense</i>	Idaho biscuitroot
<i>Lupinus argenteus</i>	silvery lupine
<i>Mertensia ciliata</i>	broad-leaf bluebells
<i>Mimulus tilingii</i>	Tiling's monkeyflower
<i>Myosotis sylvatica</i>	
<i>Orobanche fasciculata</i>	clustered broomrape
<i>Oxyria digyna</i>	mountain sorrel
<i>Parnassia fimbriata</i>	fringed grass-of-parnassu
<i>Pedicularis groenlandica</i>	elephant head
<i>Penstemon attenuatus</i>	taper-leaved penstemon
<i>Penstemon deustus</i>	hot-rock penstemon
<i>Penstemon fruticosus</i>	shrubby penstemon
<i>Penstemon humilis</i>	lowly penstemon
<i>Penstemon montanus</i>	cordroot beardtongue
<i>Petrophytum caespitosum</i>	Rocky Mountain rockmat
<i>Phacelia hastata</i>	whiteleaf phacelia
<i>Phacelia sericea</i>	silky phacelia
<i>Polemonium viscosum</i>	sticky polemonium
<i>Potentilla</i> sp.	cinquefoil
<i>Potentilla brevifolia</i>	sparseleaf cinquefoil
<i>Potentilla diversifolia</i>	diverse-leaved cinquefoil
<i>Potentilla glandulosa</i>	sticky cinquefoil
<i>Potentilla ovina</i>	sheep cinquefoil
<i>Pyrola picta</i>	white-vein pyrola
<i>Ranunculus andersonii</i>	Anderson's buttercup

<i>Ranunculus eschscholtzii</i>	subalpine buttercup
<i>Ranunculus verecundus</i>	wetslope buttercup
<i>Saxifraga</i> sp.	saxifrage
<i>Saxifraga arguta</i>	brook saxifrage
<i>Sedum debile</i>	weak-stemmed stonecrop
<i>Sedum lanceolatum</i>	lance-leaved stonecrop
<i>Senecio fremontii</i>	dwarf mountain ragwort
<i>Senecio integerrimus</i>	western groundsel
<i>Senecio serra</i>	tall ragwort
<i>Senecio streptanthifolius</i>	Rocky Mtn. butterweed
<i>Senecio triangularis</i>	arrowleaf groundsel
<i>Senecio werneriaefolius</i>	
<i>Sibbaldia procumbens</i>	creeping sibbaldia
<i>Silene repens</i>	pink campion
<i>Solidago multiradiata</i>	northern goldenrod
<i>Taraxacum officinale</i>	common dandelion
<i>Thalictrum occidentale</i>	meadow rue
<i>Thlaspi montanum idahoense</i>	
<i>Townsendia montana</i>	Wyoming Townsend daisy
<i>Valeriana acutiloba</i>	sharpleaf valerian
<i>Valeriana sitchensis</i>	Sitka valerian
<i>Veronica wormskjoldii</i>	alpine speedwell
<i>Viola purpurea</i>	goosefoot violet
<i>Zigadenus elegans</i>	mountain deathcamas
Grasses, rushes, sedges	
<i>Agropyron spicatum</i>	bluebunch wheatgrass
<i>Agropyron trachycaulum</i>	slender wheatgrass
<i>Bromus marginatus</i>	mountain brome
<i>Carex geayeri</i>	elk sedge
<i>Carex microptera</i>	small-winged sedge
<i>Carex proposita</i>	Great Smoky Mountain sedge
<i>Carex rossii</i>	Ross sedge
<i>Carex subnigricans</i>	
<i>Deschampsia caespitosa</i>	tufted hairgrass
<i>Festuca idahoensis</i>	Idaho fescue
<i>Juncus</i> sp.	rush
<i>Juncus parviflorus</i>	smallflowered woodrush
<i>Leucopoa kingii</i>	spike fescue
<i>Luzula spicata</i>	spiked woodrush
<i>Melica bulbosa</i>	onion grass
<i>Oryzopsis exigua</i>	little ricegrass
<i>Phleum alpinum</i>	alpine timothy
<i>Poa alpina</i>	alpine bluegrass
<i>Poa epilis</i>	Cusick's bluegrass
<i>Poa nervosa</i>	Wheeler's bluegrass
<i>Poa rupicola</i>	timberline bluegrass
<i>Sitanion hystrix</i>	squirreltail bottlebrush
<i>Stipa occidentalis</i>	western needlegrass
<i>Trisetum spicatum</i>	spike trisetum
Ferns and fern allies	
<i>Cystopteris fragilis</i>	brittle bladderfern

MOUNT HARRISON Vascular Plant Species List

Vascular plant species reported by Chuck Wellner on July 29, 1983; Bob Moseley on July 26, 1986 and August 10, 1987; and Steve Rust and Jennifer Miller on September 12 - 13, 2002 and October 17, 2002 are listed alphabetically by physiognomic class. Nomenclature follows Hitchcock and Cronquist (1973) for the most part.

Trees

<i>Abies lasiocarpa</i>	subalpine fir
<i>Cercocarpus ledifolius</i>	curl-leaf mountain mahogany
<i>Pinus flexilis</i>	limber pine
<i>Populus tremuloides</i>	quaking aspen

Shrubs

<i>Artemisia arbuscula</i>	little sagebrush
<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	mountain big sagebrush
<i>Berberis repens</i>	Oregon grape
<i>Ceanothus velutinus</i>	shiny-leaf ceanothus
<i>Chrysothamnus viscidiflorus</i>	green rabbit-brush
<i>Haplopappus macronema</i>	discoid goldenweed
<i>Juniperus communis</i>	comm on juniper
<i>Prunus virginiana</i>	chokecherry
<i>Ribes cereum</i>	squaw currant
<i>Ribes montigenum</i>	mountain gooseberry
<i>Rosa woodsii</i> var. <i>ultramontana</i>	Woods' rose
<i>Rubus</i> sp.	blackberry
<i>Sambucus racemosa</i>	red elderberry
<i>Symphoricarpos oreophilus</i>	mountain snowberry

Herbs

<i>Agoseris aurantiaca</i>	orange agoseris
<i>Agoseris glauca</i>	pale agoseris
<i>Antennaria microphylla</i>	rosy pussytoes
<i>Antennaria umbrinella</i>	brown pussytoes
<i>Arabis microphylla</i> sp.	littleleaf rockcress
<i>Arenaria</i>	sandwort
<i>Arenaria capillaris</i>	thread-leaved sandwort
<i>Arenaria congesta</i>	capitate sandwort
<i>Arenaria obtusiloba</i>	arctic sandwort
<i>Aster perelegans</i>	elegant aster
<i>Astragalus tenellus</i>	looseflower milkvetch
<i>Castilleja christii</i>	Christ's Indian paintbrush
<i>Castilleja inverta</i>	pale Indian paintbrush
<i>Castilleja miniata</i>	giant red Indian paintbrush
<i>Chaenactis douglasii</i>	hoary chaenactis
<i>Cirsium canovirens</i>	gray-green thistle
<i>Comandra</i> sp.	bastard toadflax
<i>Crepis</i> sp.	hawksbeard
<i>Crepis acuminata</i>	long-leaved hawksbeard
<i>Cymopterus davisii</i>	Davis' springparsley
<i>Dodecatheon pulchellum</i>	darkthroat shootingstar
<i>Epilobium angustifolium</i>	fireweed
<i>Erigeron corymbosus</i>	longleaf fleabane
<i>Erigeron rydbergii</i>	Rydberg's fleabane
<i>Eriogonum heracleoides</i>	Wyeth buckwheat

<i>Eriogonum microthecum</i> var. <i>laxiflorum</i>	slender buckwheat
<i>Eriogonum ovalifolium</i>	cushion buckwheat
<i>Eriogonum umbellatum</i>	sulfur flower
<i>Eriophyllum lanatum</i>	woolly sunflower
<i>Erysimum asperum</i>	western wallflower
<i>Frasera speciosa</i>	elkweed
<i>Geum triflorum</i>	old man's whiskers
<i>Hackelia micrantha</i>	blue stickseed
<i>Haplopappus acaulis</i>	stemless mock goldenweed
<i>Heuchera cylindrica</i> var. <i>alpina</i>	alpine alumroot
<i>Hieracium albertinum</i>	western hawkweed
<i>Lewisia pygmaea</i> var. <i>pygmaea</i>	alpine lewisia
<i>Linanthastrum nuttallii</i>	Nuttall's linanthastrum
<i>Linum perenne</i>	blue flax
<i>Lupinus</i> sp.	lupine
<i>Machaeranthera laetevirens</i>	hoary tansyaster
<i>Machaeranthera shastensis</i> var. <i>latifolia</i>	hoary tansyaster
<i>Pedicularis contorta</i>	coiled-beak lousewort
<i>Pediocactus simpsonii</i>	Simpson hedgehog cactus
<i>Penstemon attenuatus</i>	taper-leaved penstemon
<i>Penstemon humilis</i>	lowly penstemon
<i>Phlox pulvinata</i>	cushion phlox
<i>Polemonium pulcherrimum</i>	Jacob's ladder
<i>Potentilla glandulosa</i>	sticky cinquefoil
<i>Sedum debile</i>	weak-stemmed stonecrop
<i>Sedum lanceolatum</i>	lance-leaved stonecrop
<i>Sedum roseum</i>	roseroot
<i>Senecio canus</i>	woolly groundsel
<i>Sibbaldia procumbens</i>	creeping sibbaldia
<i>Solidago multiradiata</i>	northern goldenrod
<i>Spraguea umbellata</i>	pussypaws
<i>Tetradymia canescens</i>	spineless horse-brush
<i>Thalictrum occidentale</i>	meadow rue

Grasses, rushes, sedges

<i>Agropyron trachycaulum</i>	slender wheatgrass
<i>Bromus carinatus</i>	California brome
<i>Bromus inermis</i>	smooth brome
<i>Carex elynoides</i>	blackroot sedge
<i>Carex microptera</i>	small-winged sedge
<i>Carex rossii</i>	Ross sedge
<i>Danthonia intermedia</i>	timber oatgrass
<i>Danthonia unispicata</i>	onespike danthonia
<i>Festuca idahoensis</i>	Idaho fescue
<i>Juncus parryi</i>	Parry's rush
<i>Koeleria nitida</i>	prairie Junegrass
<i>Leucopoa kingii</i>	spike fescue
<i>Melica bulbosa</i>	onion grass
<i>Oryzopsis hymenoides</i>	Indian ricegrass
<i>Phleum alpinum</i>	alpine timothy
<i>Poa sandbergii</i>	Sandberg's bluegrass
<i>Sitanion hystrix</i>	squirreltail bottlebrush
<i>Stipa occidentalis</i>	western needlegrass
<i>Stipa thurberiana</i>	Thurber's needlegrass

Trisetum spicatum

spike trisetum

Ferns and fern allies

Pellaea breweri

Brewer's cliffbrake

Polystichum scopulinum

rock swordfern

POLE CANYON Vascular Plant Species List

Vascular plant species reported by Chuck Wellner on June 1, 1987 and Steve Rust and Jennifer Miller on October 10 - 11, 2002 are listed alphabetically by physiognomic class. Nomenclature follows Hitchcock and Cronquist (1973) for the most part.

Trees

<i>Abies lasiocarpa</i>	subalpine fir
<i>Populus tremuloides</i>	quaking aspen
<i>Pseudotsuga menziesii</i>	Douglas-fir

Shrubs

<i>Amelanchier alnifolia</i>	serviceberry
<i>Artemisia arbuscula</i>	little sagebrush
<i>Artemisia nova</i>	black sagebrush
<i>Artemisia spiciformis</i>	big sagebrush
<i>Artemisia tridentata vaseyana</i>	mountain big sagebrush
<i>Berberis repens</i>	Oregon grape
<i>Chrysothamnus viscidiflorus</i>	green rabbit-brush
<i>Pachistima myrsinites</i>	boxwood
<i>Physocarpus malvaceus</i>	ninebark
<i>Prunus virginiana</i>	chokecherry
<i>Ribes montigenum</i>	mountain gooseberry
<i>Ribes viscosissimum</i>	sticky currant
<i>Rosa gymnocarpa</i>	baldhip rose
<i>Sorbus scopulina</i>	Cascade mountain-ash
<i>Symphoricarpos oreophilus</i>	mountain snowberry

Herbs

<i>Agastache urticifolia</i>	nettle-leaf horsemint
<i>Agoseris glauca</i>	pale agoseris
<i>Allium acuminatum</i>	tapertipped onion
<i>Antennaria microphylla</i>	rosy pussytoes
<i>Aquilegia</i> sp.	columbine
<i>Arenaria aculeata</i>	needleleaf sandwort
<i>Artemisia frigida</i>	prairie sagewort
<i>Aster perelegans</i>	elegant aster
<i>Astragalus purshii</i>	Pursh's milk-vetch
<i>Astragalus spatulatus</i>	tufted milkvetch
<i>Balsamorhiza sagittata</i>	arrowleaf balsamroot
<i>Chaenactis douglasii</i>	hoary chaenactis
<i>Cirsium canovirens</i>	gray-green thistle
<i>Claytonia lanceolata</i>	western springbeauty
<i>Collinsia parviflora</i>	small-flowered blue-eyed Mary
<i>Collomia grandiflora</i>	grand collomia
<i>Crepis acuminata</i>	long-leaved hawksbeard
<i>Cryptantha</i> sp.	cryptantha
<i>Delphinium nuttallianum</i>	Nutthall's larkspur
<i>Disporum hookeri</i>	drops of gold
<i>Erigeron compositus</i>	cut-leaved daisy
<i>Erigeron nanus</i>	dwarf fleabane
<i>Eriogonum heracleoides</i>	Wyeth buckwheat
<i>Eriogonum microthecum</i>	slender buckwheat
<i>Erysimum asperum</i>	western wallflower

<i>Fragaria vesca</i>	wild strawberry
<i>Frasera speciosa</i>	elkweed
<i>Fritillaria pudica</i>	yellow fritillary
<i>Gilia aggregata</i>	scarlet gilia
<i>Goodyera oblongifolia</i>	rattlesnake-plantain
<i>Hackelia micrantha</i>	blue stickseed
<i>Hackelia patens</i>	spotted stickseed
<i>Haplopappus acaulis</i>	stemless mock goldenweed
<i>Hydrophyllum capitatum</i>	ballhead waterleaf
<i>Lesquerella occidentalis</i>	western bladderpod
<i>Linum perenne</i>	blue flax
<i>Lithophragma tenella</i>	slender prairiestar
<i>Lomatium foeniculaceum</i>	desert biscuitroot
<i>Lupinus argenteus</i>	silvery lupine
<i>Mertensia</i> sp.	bluebells
<i>Mertensia ciliata</i>	broad-leaf bluebells
<i>Mitella</i> sp.	mitrewort
<i>Osmorhiza chilensis</i>	mountain sweet cicely
<i>Osmorhiza occidentalis</i>	western sweet-cicely
<i>Pediocactus simpsonii</i> var. <i>robustior</i>	snowball cactus
<i>Penstemon globosus</i>	globe penstemon
<i>Penstemon humilis</i>	lowly penstemon
<i>Phlox austromontana</i>	desert phlox
<i>Senecio canus</i>	woolly groundsel
<i>Senecio integerrimus</i>	western groundsel
<i>Senecio serra</i>	tall ragwort
<i>Silene</i> sp.	catchfly
<i>Silene menziesii</i>	Menzies' campion
<i>Taraxacum officinale</i>	common dandelion
<i>Thalictrum occidentale</i>	western meadowrue
<i>Tragopogon dubius</i>	common salsify
<i>Urtica dioica</i>	stinging nettles
<i>Valeriana occidentalis</i>	western valerian
<i>Valeriana sitchensis</i>	Sitka valerian
<i>Viola orbiculata</i>	round-leaved violet

Grasses, rushes, sedges

<i>Bromus carinatus</i>	California brome
<i>Bromus marginatus</i>	mountain brome
<i>Calamagrostis rubescens</i>	pinegrass
<i>Carex geyeri</i>	elk sedge
<i>Carex microptera</i>	small-winged sedge
<i>Elymus glaucus</i>	blue wildrye
<i>Koeleria cristata</i>	prairie junegrass
<i>Leucopoa kingii</i>	spike fescue
<i>Melica bulbosa</i>	onion grass
<i>Poa secunda</i>	Sandberg's bluegrass
<i>Stipa columbiana</i>	Dore's needlegrass

POLE CREEK EXCLOSURE Vascular Plant Species List

Vascular plant species reported by Chuck Wellner on August 2, 1982; Bob Moseley on August 7, 1987; and Steve Rust and Jennifer Miller on August 28, 2002 and September 27, 2002 are listed alphabetically by physiognomic class. Nomenclature follows Hitchcock and Cronquist (1973) for the most part.

Trees

<i>Abies lasiocarpa</i>	subalpine fir
<i>Picea engelmannii</i>	Engelmann spruce
<i>Pinus contorta</i>	lodgepole pine
<i>Populus tremuloides</i>	quaking aspen
<i>Pseudotsuga menziesii</i>	Douglas-fir

Shrubs

<i>Artemisia cana</i>	silver sagebrush
<i>Artemisia tridentata vaseyana</i>	mountain big sagebrush
<i>Betula glandulosa</i>	bog birch
<i>Ceanothus velutinus</i>	shiny-leaf ceanothus
<i>Chrysothamnus nauseosus</i>	green rabbit-brush
<i>Chrysothamnus viscidiflorus</i>	green rabbit-brush
<i>Iliamna rivularis</i>	globemallow
<i>Potentilla fruticosa</i>	shrubby cinquefoil
<i>Ribes cereum</i>	squaw currant
<i>Ribes inerme</i>	whitestem gooseberry
<i>Ribes lacustre</i>	swamp gooseberry
<i>Ribes viscosissimum</i>	sticky currant
<i>Rosa gymnocarpa</i>	baldhip rose
<i>Salix boothii</i>	Booth's willow
<i>Salix wolfii</i>	Wolf's willow
<i>Shepherdia canadensis</i>	buffaloberry
<i>Symphoricarpos oreophilus</i>	mountain snowberry

Herbs

<i>Agoseris grandiflora</i>	bigflower agoseris
<i>Angelica</i> sp.	angelica
<i>Antennaria microphylla</i>	rosy pussytoes
<i>Antennaria stenophylla</i>	narrowleaf pussytoes
<i>Arabis</i> sp.	rockcress
<i>Arnica cordifolia</i>	heart-leaved arnica
<i>Aster</i> sp.	aster
<i>Aster foliaceus</i>	leafy aster
<i>Aster perelegans</i>	elegant aster
<i>Calochortus eurycarpus</i>	wide-fruit mariposa
<i>Castilleja lutescens</i>	stiff yellow Indian paintbrush
<i>Castilleja miniata</i>	giant red Indian paintbrush
<i>Cirsium canovirens</i>	gray-green thistle
<i>Collomia linearis</i>	narrow-leaf collomia
<i>Crepis acuminata</i>	long-leaved hawksbeard
<i>Descurainia richardsonii</i>	mountain tansymustard
<i>Epilobium angustifolium</i>	fireweed
<i>Erigeron pumilus</i>	shaggy fleabane
<i>Eriogonum heracleoides</i>	Wyeth buckwheat
<i>Eriogonum umbellatum</i>	sulfur flower
<i>Fragaria virginiana</i>	strawberry

<i>Gentiana</i> sp.	gentian
<i>Geranium viscosissimum</i>	sticky geranium
<i>Geum macrophyllum</i>	largeleaf avens
<i>Geum triflorum</i>	old man's whiskers
<i>Hackelia micrantha</i>	blue stickseed
<i>Haplopappus</i> sp.	goldenweed
<i>Haplopappus acaulis</i>	stemless mock goldenweed
<i>Hieracium albertinum</i>	western hawkweed
<i>Horkelia</i> sp.	horkelia
<i>Hydrophyllum capitatum</i>	ballhead waterleaf
<i>Linum perenne</i>	blue flax
<i>Lithospermum ruderales</i>	Columbia pucoon
<i>Lupinus lepidus</i>	Pacific lupine
<i>Machaeranthera canescens</i>	hoary aster
<i>Mertensia</i> sp.	bluebells
<i>Mimulus primuloides</i>	primrose monkey-flower
<i>Nemophila</i> sp.	baby blue eyes
<i>Osmorhiza chilensis</i>	mountain sweet cicely
<i>Pedicularis groenlandica</i>	elephant head
<i>Penstemon humilis</i>	lowly penstemon
<i>Phlox diffusa</i>	spreading phlox
<i>Polemonium</i> sp.	Jacob's-ladder
<i>Polygonum douglasii</i>	Douglas' knotweed
<i>Potentilla gracilis</i>	slender cinquefoil
<i>Potentilla palustris</i>	purple marshlocks
<i>Ranunculus</i> sp.	buttercup
<i>Sedum lanceolatum</i>	lance-leaved stonecrop
<i>Senecio pseud aureus</i>	falsegold groundsel
<i>Senecio streptanthifolius</i>	Rocky Mtn. butterweed
<i>Sisyrinchium</i> sp.	blue-eyed grass
<i>Sisyrinchium idahoense</i>	Idaho blue-eyed grass
<i>Smilacina stellata</i>	false Solomon's seal
<i>Swertia perennis</i>	felwort
<i>Taraxacum officinale</i>	common dandelion
<i>Tetradymia canescens</i>	spineless horse-brush
<i>Thalictrum occidentale</i>	western meadowrue
<i>Trifolium longipes</i>	longstalk clover
<i>Valeriana edulis</i>	tobacco root
<i>Veronica</i> sp.	speedwell

Grasses, rushes, sedges

<i>Agropyron smithii</i>	bluestem wheatgrass
<i>Agropyron spicatum</i>	bluebunch wheatgrass
<i>Bromus carinatus</i>	California brome
<i>Bromus marginatus</i>	mountain brome
<i>Bromus tectorum</i>	cheat grass
<i>Calamagrostis canadensis</i>	bluejoint
<i>Calamagrostis rubescens</i>	pinegrass
<i>Carex aquatilis</i>	water sedge
<i>Carex geyeri</i>	elk sedge
<i>Carex microptera</i>	small-winged sedge
<i>Carex rostrata</i>	beaked sedge
<i>Danthonia intermedia</i>	timber oatgrass
<i>Deschampsia cespitosa</i>	tufted hairgrass

Festuca idahoensis
Juncus sp.
Juncus balticus
Koeleria cristata
Muhlenbergia sp.
Phleum alpinum
Phleum pratense
Poa pratensis
Poa secunda
Sitanion hystrix
Stipa columbiana
Stipa occidentalis

Idaho fescue
rush
Baltic rush
prairie junegrass
muhly
alpine timothy
common timothy
Kentucky bluegrass
Sandberg's bluegrass
squirreltail bottlebrush
Dore's needlegrass
western needlegrass

Ferns and fern allies

Equisetum hyemale

common scouring-rush

REDFISH LAKE Vascular Plant Species List

Vascular plant species reported by Bob Moseley on August 6, 1987 and Steve Rust and Jennifer Miller on September 12 - 13, 2002 and October 17, 2002 are listed alphabetically by physiognomic class with habitat group. Nomenclature follows Hitchcock and Cronquist (1973) for the most part. Habitat groups are:

1. Moraine forest

- Pseudotsuga menziesii*/*Carex geyeri*, *Symphoricarpos oreophilus* phase
- Pseudotsuga menziesii*/*Calamagrostis rubescens*, *Calamagrostis rubescens* phase
- Pinus contorta*/*Carex geyeri* c.t.
- Abies lasiocarpa*/*Carex geyeri*, *Carex geyeri* phase

2. Lakeshore

- Abies lasiocarpa*/*Menziesia ferruginea*, *Menziesia ferruginea* phase
- Abies lasiocarpa*/*Vaccinium scoparium*, *Calamagrostis rubescens* phase
- Abies lasiocarpa*/*Ledum glandulosum*
- Alnus sinuata* c.t.

Lakeshore community below mean high water.

Species	Common name	Habitat	
		1	2
Trees			
<i>Abies lasiocarpa</i>	subalpine fir	x	x
<i>Picea engelmannii</i>	Engelmann spruce		x
<i>Pinus albicaulis</i>	whitebark pine	x	
<i>Pinus contorta</i>	lodgepole pine	x	x
<i>Pinus ponderosa</i>	Ponderosa pine	x	
<i>Pseudotsuga menziesii</i>	Douglas-fir	x	
Shrubs			
<i>Alnus sinuata</i>	Sitka alder		x
<i>Amelanchier alnifolia</i>	serviceberry		x
<i>Arctostaphylos uva-ursi</i>	kinnikinnick	x	
<i>Artemisia tridentata vaseyana</i>	mountain big sagebrush	x	
<i>Berberis repens</i>	Oregon grape	x	
<i>Betula glandulosa</i>	bog birch		x
<i>Chrysothamnus nauseosus</i>	green rabbit-brush	x	
<i>Juniperus communis</i>	common juniper	x	
<i>Ledum glandulosum</i>	smooth labrador-tea		x
<i>Lonicera involucrata</i>	black twinberry		x
<i>Lonicera utahensis</i>	Utah honeysuckle	x	
<i>Menziesia ferruginea</i>	menziesia		x
<i>Potentilla fruticosa</i>	shrubby cinquefoil		x
<i>Purshia tridentata</i>	antelope bitterbrush	x	
<i>Ribes cereum</i>	squaw currant	x	
<i>Ribes lacustre</i>	swamp gooseberry		x
<i>Ribes viscosissimum</i>	sticky currant	x	
<i>Rubus parviflorus</i>	thimbleberry	x	
<i>Salix scouleriana</i>	Scouler willow	x	
<i>Sambucus racemosa</i>	red elderberry	x	
<i>Shepherdia canadensis</i>	buffaloberry		x
<i>Spiraea pyramidata</i>	pyramid spiraea		x
<i>Spiraea betulifolia</i>	birch-leaved spiraea	x	
<i>Symphoricarpos oreophilus</i>	mountain snowberry	x	

<i>Vaccinium caespitosum</i>	dwarf huckleberry	x
<i>Vaccinium occidentale</i>	western huckleberry	x
<i>Vaccinium scoparium</i>	grouse whortleberry	x

Herbs

<i>Antennaria microphylla</i>	rosy pussytoes	x
<i>Antennaria racemosa</i>	raceme pussytoes	x
<i>Arenaria capillaris</i>	thread-leaved sandwort	x
<i>Balsamorhiza sagittata</i>	arrowleaf balsamroot	x
<i>Chimaphila umbellata</i>	prince's pine	x
<i>Epilobium angustifolium</i>	fireweed	x
<i>Geranium viscosissimum</i>	sticky geranium	x
<i>Hieracium albertinum</i>	western hawkweed	x
<i>Hieracium albiflorum</i>	white-flowered hawkweed	x
<i>Lupinus lepidus</i>	prairie lupine	x
<i>Mentha arvensis</i>	wild mint	x
<i>Penstemon fruticosus</i>	shrubby penstemon	x
<i>Pyrola picta</i>	white-vein pyrola	x
<i>Pyrola secunda</i>	sidebells pyrola	x

Grasses, sedges, rushes

<i>Calamagrostis canadensis</i>	bluejoint	x
<i>Calamagrostis rubescens</i>	pinegrass	x
<i>Carex aquatilis</i>	water sedge	x
<i>Carex geyeri</i>	elk sedge	x
<i>Carex rossii</i>	Ross sedge	x
<i>Deschampsia cespitosa</i>	tufted hairgrass	x
<i>Festuca idahoensis</i>	Idaho fescue	x
<i>Oryzopsis exigua</i>	little ricegrass	x
<i>Poa nervosa</i>	Wheeler's bluegrass	x
<i>Sitanion hystrix</i>	squirreltail bottlebrush	x

Ferns and fern allies

<i>Equisetum arvense</i>	field horsetail	x
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TRAPPER CREEK Vascular Plant Species List

Vascular plant species reported by Chuck Wellner on May 31, 1987; Bob Moseley on August 12, 1987; and Steve Rust and Jennifer Miller on September 11, 2002 are listed alphabetically by physiognomic class with habitat group. Nomenclature follows Hitchcock and Cronquist (1973) for the most part.

Trees

Juniperus osteosperma Utah juniper

Shrubs

Artemisia arbuscula ssp. *arbuscula* little sagebrush
Artemisia arbuscula ssp. *nova* black sagebrush
Artemisia tridentata *vaseyana* mountain big sagebrush
Artemisia tridentata *wyomingensis* Wyoming big sagebrush
Berberis aquifolium var. *repens* creeping barberry
Chrysothamnus viscidiflorus green rabbit-brush
Holodiscus dumosus ocean spray
Purshia tridentata antelope bitterbrush
Ribes cereum squaw currant
Ribes viscosissimum sticky currant
Symphoricarpos oreophilus mountain snowberry

Herbs

Allium acuminatum tapertipped onion
Antennaria microphylla rosy pussytoes
Arabis sp. rockcress
Arenaria aculeata needleleaf sandwort
Aster perelegans elegant aster
Aster scopulorum Lava aster
Astragalus purshii Pursh's milk-vetch
Balsamorhiza hookeri Hooker's balsamroot
Calochortus nuttallii sego lily
Castilleja angustifolia northwestern Indian paintbrush
Castilleja miniata giant red Indian paintbrush
Chaenactis douglasii hoary chaenactis
Collinsia parviflora small-flowered blue-eyed Mary
Comandra umbellata bastard toadflax
Cordylanthus ramosus bushy bird's beak
Crepis acuminata long-leaved hawksbeard
Cryptantha sp. cryptantha
Erigeron pumilus shaggy fleabane
Eriogonum caespitosum matted buckwheat
Eriogonum heracleoides Wyeth buckwheat
Eriogonum microthecum slender buckwheat
Eriogonum ovalifolium cushion buckwheat
Eriogonum umbellatum sulfur flower
Gilia sinuata rosy gilia
Hackelia micrantha blue stickseed
Haplopappus acaulis stemless mock goldenweed
Heuchera grossulariifolia alumroot
Hieracium albertinum western hawkweed
Leptodactylon pungens granite prickly phlox
Lewisia rediviva bitterroot
Lomatium grayi Gray's lomatium

<i>Lupinus argenteus</i>	silvery lupine
<i>Microsteris gracilis</i>	microsteris
<i>Opuntia polyacantha</i>	plains pricklypear
<i>Orobanche corymbosa</i>	flat-top broomrape
<i>Orobanche uniflora</i>	naked broomrape
<i>Pediocactus simpsonii</i>	Simpson hedgehog cactus
<i>Penstemon deustus</i>	hot-rock penstemon
<i>Penstemon humilis</i>	lowly penstemon
<i>Phacelia hastata</i>	whiteleaf phacelia
<i>Phlox hoodii</i>	Hood's phlox
<i>Phlox longifolia</i>	long-leaf phlox
<i>Phlox pulvinata</i>	cushion phlox
<i>Sedum lanceolatum</i>	lance-leaved stonecrop
<i>Sedum roseum</i>	roseroot
<i>Senecio canus</i>	woolly groundsel
<i>Senecio integerrimus</i>	western groundsel
<i>Senecio multilobatus</i>	lobeleaf groundsel
<i>Silene douglasii</i>	seabluff catchfly
<i>Zigadenus venenosus</i>	death camas

Grasses, rushes, sedges

<i>Bromus tectorum</i>	cheat grass
<i>Carex geyeri</i>	elk sedge
<i>Carex rossii</i>	Ross sedge
<i>Festuca idahoensis</i>	Idaho fescue
<i>Oryzopsis hymenoides</i>	Indian ricegrass
<i>Poa secunda</i>	Sandberg's bluegrass
<i>Sitanion hystrix</i>	squirreltail bottlebrush
<i>Stipa</i> sp.	needlegrass
<i>Stipa comata</i>	needle and thread
<i>Stipa thurberiana</i>	Thurber's needlegrass