Mt. Peale Research Natural Area Alpine Vegetation Impact Assessment
Final Report

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I. Introduction

The La Sal Mountains above Moab, Utah support a unique alpine vegetation community featuring several endemic plant species. The extent of true alpine ecosystems is limited on the Colorado Plateau, as the type occurs only on isolated sky islands. One Forest Service sensitive plant species, the La Sal daisy (*Erigeron mancus*), is found nowhere else in the world. Numerous plant species found on the La Sal Mountains represent the only populations in the state of Utah. These species include *Androsace chamaejasme* var. *carinata* (also a USFS sensitive species), *Besseya alpina, Carex perglobosa, Erigeron melanocephalus, Oreoxis bakeri, Podistera eastwoodiae, Saxifraga bronchialis* and *Senecio fremontii* var. *inexpectatus*. All of these species have a NatureServe (2008) state ranking as imperiled or critically imperiled.

Recreation, mainly from trampling effects, has been well documented as an impact on alpine soils and vegetation (Whinam and Chilcott 2003, Rochefort and Swinney 2000, Hartley 2000, Willard and Marr 1970). The alpine ecosystem, with short growing seasons, shallow soils and steep slopes, is a harsh environment for plants. The subsequent long-term recovery times, limited restoration potential and specialized, endemic species make any impacts significant. With increasing recreation use, and also increasing requests for outfitter/guide and special event permits, a need to assess the extent of impacts on the La Sal Mountains, especially in the Mt. Peale Research Natural Area (RNA) has been identified.

Research natural areas are part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on National Forest System lands. Research natural areas are for nonmanipulative research, observation, and study. Forest Service objectives (FSM 4063) for these areas include protection against serious environmental disruptions and serving as baseline areas for measuring long-term ecological changes. The Mt. Peale RNA was established specifically to protect ecosystem structure and function in representative alpine and subalpine habitats.

The Manti-La Sal National Forest Land and Resource Management Plan (1986) requires management of the designated area with an emphasis on research, interpretation and protection against use that could jeopardize the diversity and pristine condition that led to original establishment of the RNA. It is important to maintain pristine conditions so that long-term changes can be monitored. Due to a lack of funding, permanent study plots have never been established in the Mt. Peale RNA. Information on current conditions would help in protection and management of the area.

The main research question identified was: Is recreation disturbing the alpine turf vegetation, leaving evidence of human activity and possibly impacting natural processes that the RNA was established to protect? A study to assess the current impacts to the La Sal Mountain alpine environment from human recreational activities was proposed by the Moab District of the Manti-La Sal National Forest, and funded by Canyonlands Natural History Association. The study was conducted by Dr. James Fowler from the Flagstaff

Lab of the Rocky Mountain Research Station, USFS, in cooperation with the Manti-La Sal National Forest.

II. Study Area

The study area is the central high peaks of the La Sal Mountains in Grand and San Juan Counties in southeastern Utah. The area is managed by the USDA Forest Service as the Manti-La Sal National Forest, Moab Ranger District. The area defined as the Mt. Peale Research Natural Area (RNA) was the focus, but study plots were established in areas outside the RNA to sample impacts on sensitive plant species habitat (see map, Appendix 1). Elevations of the study plots range from 10,600 ft in upper Gold Basin to 12,270 ft on Mt Laurel.

Five broadly defined types of habitat have been identified in the Mt Peale RNA, three in the alpine zone and two in the forested, subalpine zone (100 acres). The well-developed alpine turf communities are uncommon. Combined with the alpine turf-rock community type, there is a total of 360 acres of herbaceous alpine vegetation. The majority of the area is dominated by talus and barren rock (2020 acres).

III. Methods

The alpine vegetation of the La Sal Peaks in the Mt. Peale Research Natural Area (out of 2380 acres, approximately 460 acres are vegetated) was stratified by location (Mt. Mellenthin, Mt. Tukuhnikivatz/Gold Basin and crestline), and 16 plots were sampled in vegetated polygons. An additional 33 plots were located based on habitat locations of *Erigeron mancus* in the alpine turf-rock communities. Some of these plots are outside the RNA boundary (Figure 1).

The plots were established and read in July 2008 by a crew of 5 researchers, including Dr. James Fowler, 3 biological technicians from RMRS and 1 biological technician from the Manti-La Sal National Forest.

The plots were not physically marked, but UTMs of the center point were located with global positioning system equipment and photo points were established (Appendix 2). Within the 0.1 acre plots, basic site data (slope, aspect, elevation, dominant vegetation, % bare ground, % vegetative cover) was collected. Condition classes, as tested by Rochefort and Swinney (2000) for a study on Mt. Rainier, were used to identify the level of human impact in the plot. The 5 condition classes range from pristine (0) with no signs of human use to (4) 50% or more of the site with permanent impacts. Polygons of Forest Service sensitive plants (*Erigeron mancus* and *Androsace chamaejasme* var. *carinata*) were located and mapped.

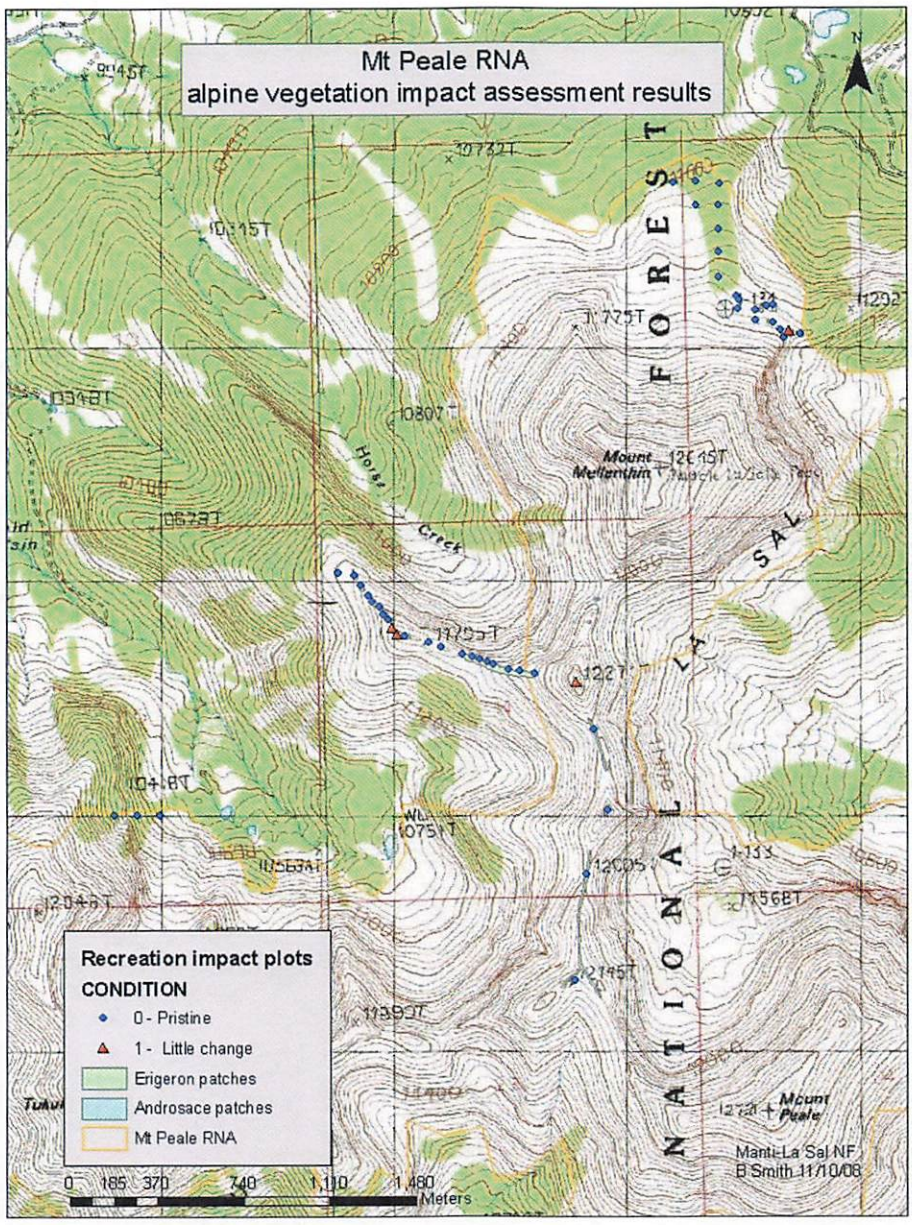

Figure 1. Alpine vegetation impact assessment plot locations and results.

IV. Results

On the 16 randomly selected alpine vegetation plots, vegetation cover varied greatly from 10-90%. With the exception of 1 plot on the crestline, all were rated as (0) pristine, with

no evidence of human impact. One plot on Laurel Peak was rated a (1) little change due to a trail in a portion of the plot.

Out of the 33 sensitive plant polygons, 3 were rated as showing evidence of human impact. Two are on the "Laurel Highway", a commonly used approach to the peaks from the northwest. One study plot with a (1) rating is on a ridge below Mt. Mellenthin. The (1) little change ratings were all related to evidence of trails and associated trampling.

Approximately10.5 acres of *Erigeron mancus* and 7.8 acres of *Androsace chamaejasme* occupied habitat were mapped (Appendix 1).

While it was planned to count and then sample sites with evidence of obvious heavy human impact such as camping, fire rings, human waste, litter and severe plant damage, this level of use was not identified in the areas sampled. Social trails, with some plant trampling and displacement of rocks contributed the majority of the human sign observed.

V. Discussion

The majority of sites sampled were rated as pristine. Hiking trails were the main source of soil disturbance and site changes. No evidence of camping or grazing from livestock or pack stock (feral and pack goats have been known to use area) was found above treeline in the areas sampled. Evidence of human impacts, even on the commonly used hiking routes that were sampled, was rated as light. The study found limited off-trail trampling in vegetated areas. Rock displacement on talus slopes was the most obvious sign of human impacts.

The plots rated as showing impact (4 sites or 8% of sites sampled) included 3 on the Laurel Highway, a trail accessing the peaks from the Gold Basin road, and one site on a ridge below Mt. Mellenthin used as an approach route. Two of these areas are within the RNA, the other two occur below the RNA boundary. Other areas that may receive heavy recreational use as approaches to the peaks, such as the south side of Mt. Peale and Mt. Tukuhnikivatz above La Sal Pass and the head of Dark Canyon, were not sampled.

The need for additional baseline sampling areas was identified, and the local Moab District office of the MLNF plans to establish several more plots in the 2009 season. The plots established in this study can be relocated, photographed and monitored in future years. The information from this research will be used on a District, Forest and Region level. It will inform Manti-La Sal National Forest planning efforts. The Forest Service can use the information and results from the project as a greatly needed assessment of recreation use and potential impacts in the area, and to inform future monitoring of the area. The data has implications for management of the area, especially as related to permitted activities (outfitter/guides), designated trails and dispersed camping.

The data provide a preliminary impact assessment, and a baseline for monitoring and management of alpine areas and the Mt Peale Research Natural Area. The information

will be used to direct education efforts for users of the alpine communities, and specifically the permitted outfitters/guides who want to use the area. As social trails are already established on the peaks, management can encourage their use and avoid the establishment of new routes. Based on the information gathered from this study, and from Manti-La Sal National Forest and RNA management direction, current policy and management of the area regarding outfitter/guides and special events will be continued.

In addition to continued monitoring and more human impact plots on the south side of the range, a need for further research on sensitive plant species distribution and possible climate change effects was identified.

VI. References

Hartley, E. 2000. *Thirty-year monitoring of subalpine meadow vegetation following a 1967 trampling experiment at Logan Pass, Glacier National Park, Montana.* In: Cole, D.N.; McCool S.F.; Borrie, W.T.; O'Loughlin, J., comps. Wilderness science in a time of change conference – Vol. 5: Wilderness ecosystems, threats and management. Proceedings RMRS-P-15-Vol 5. USDA Forest Service, Rocky Mountain Research Station.

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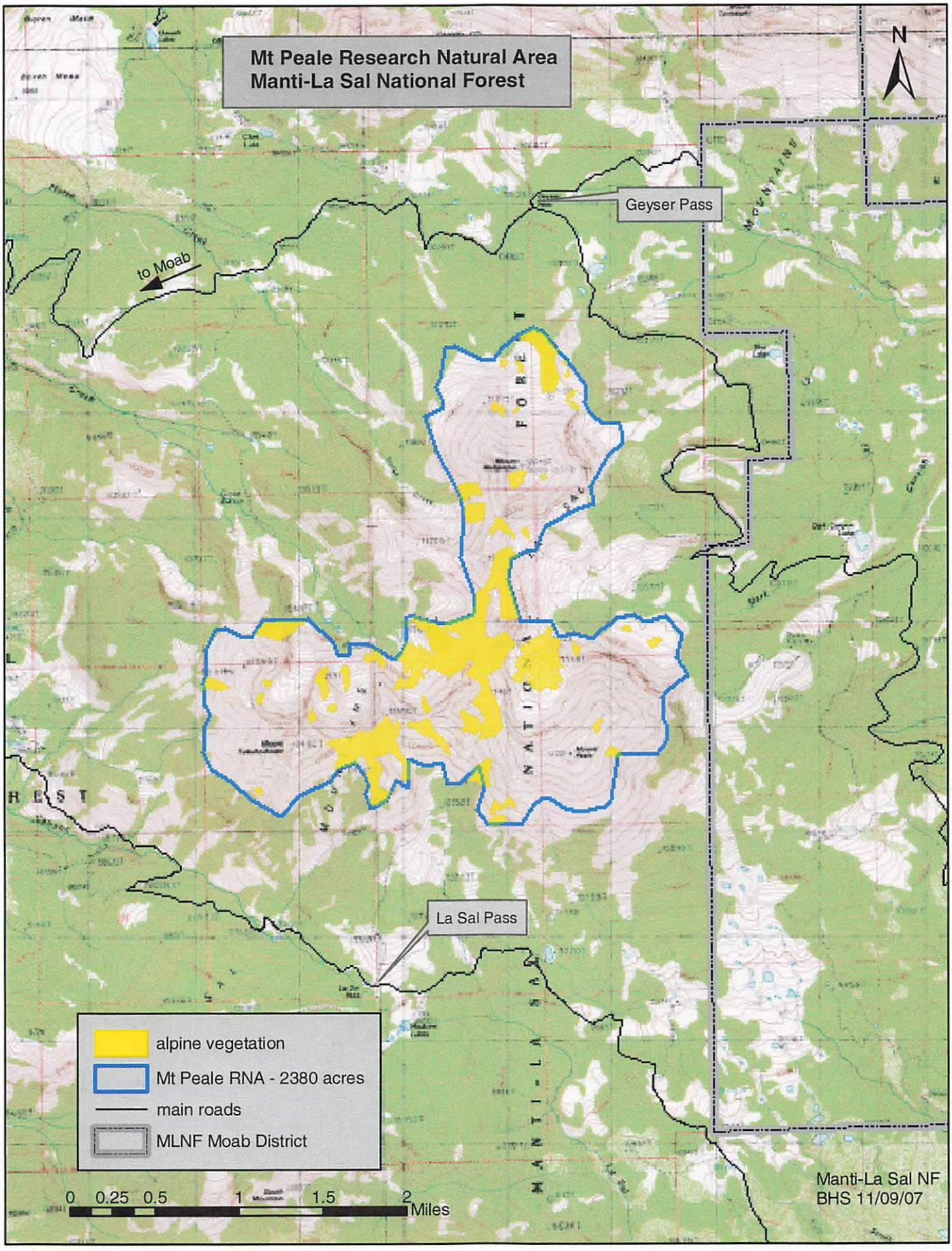
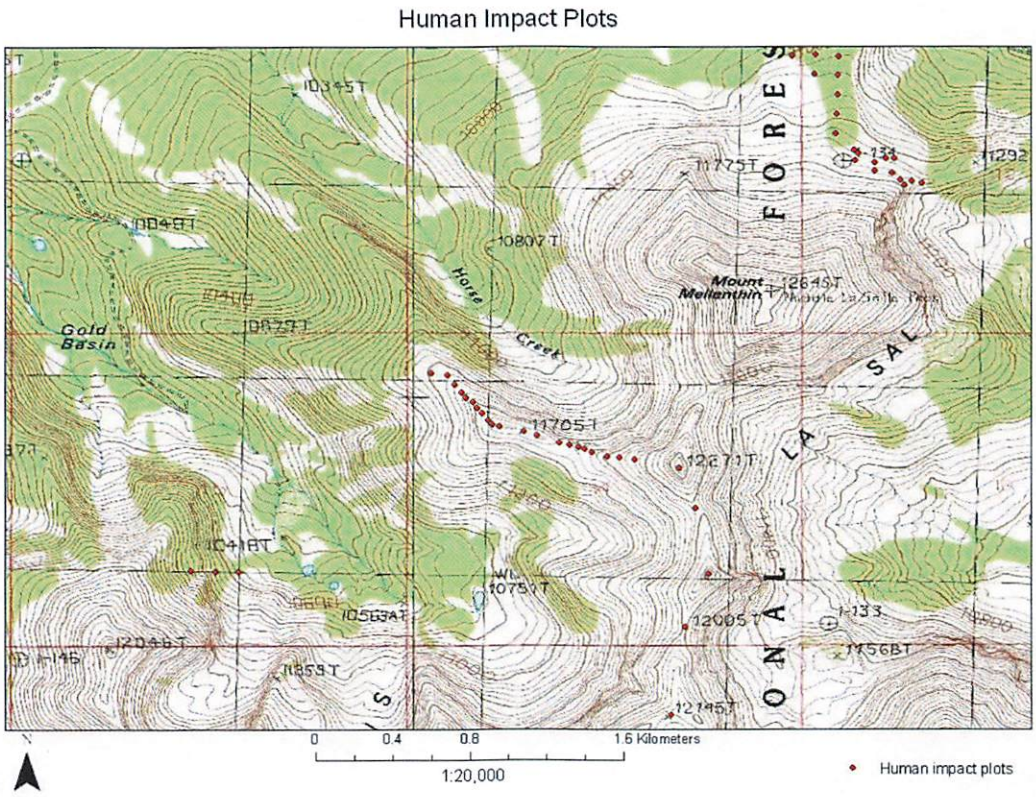
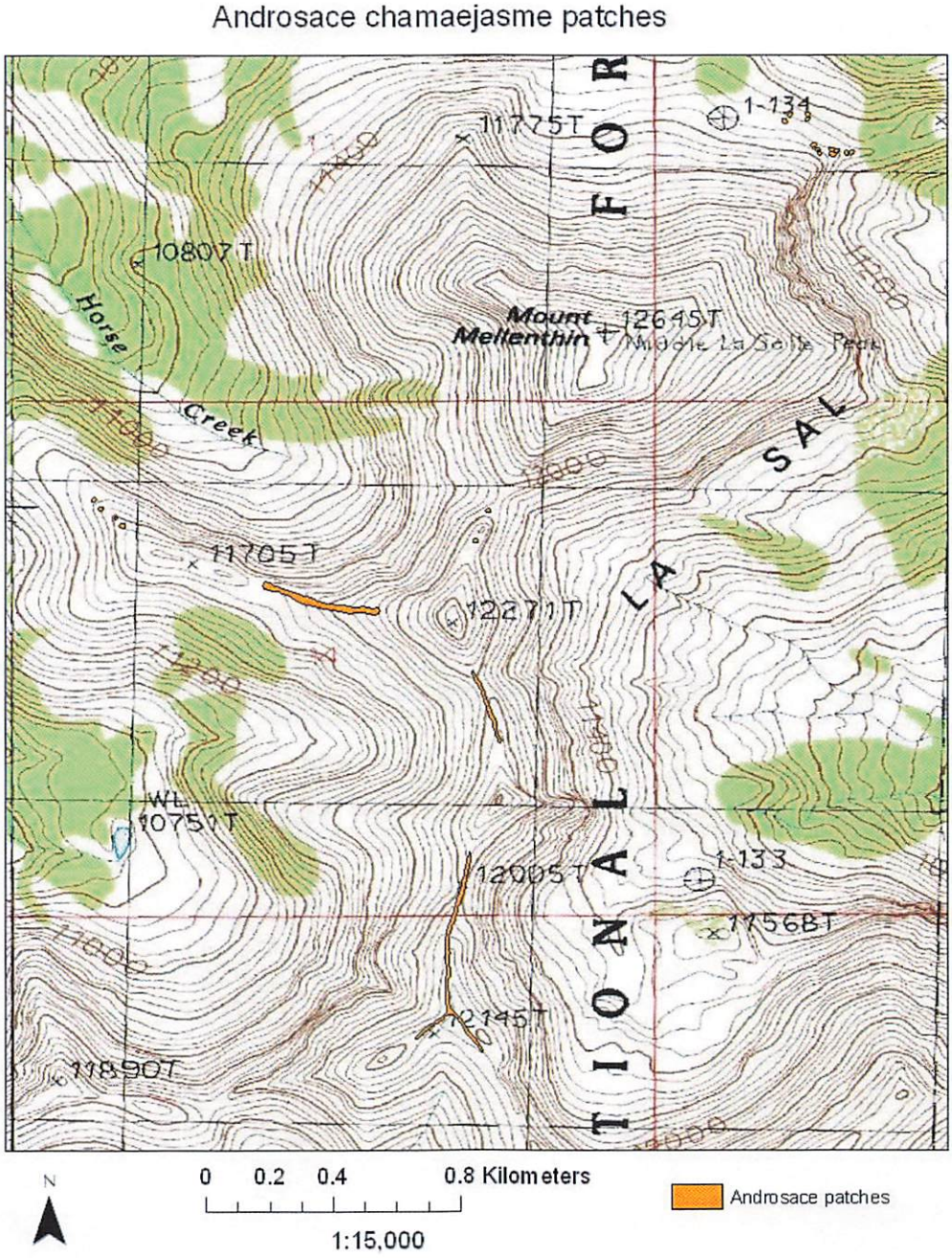
APPENDIX 1

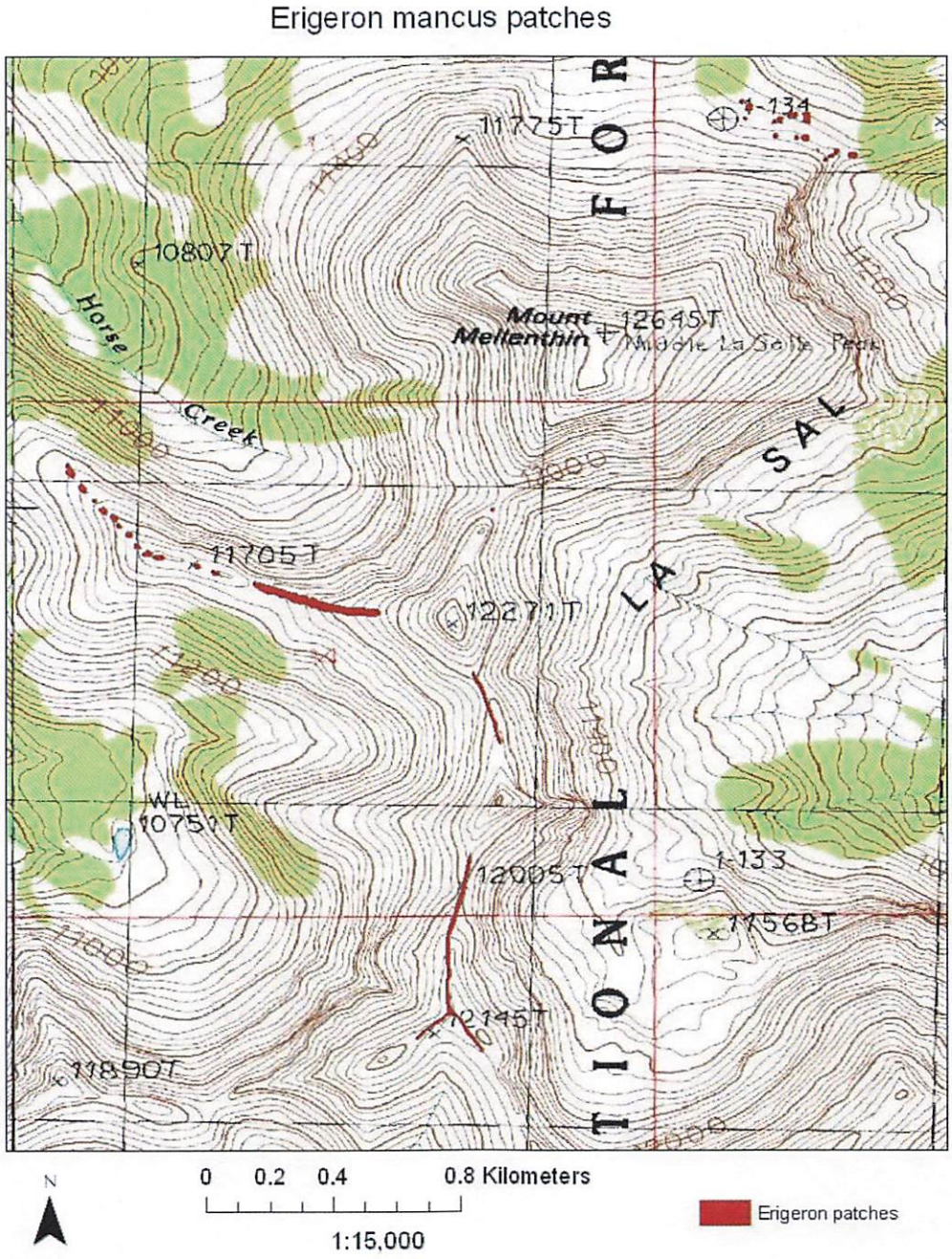

Mt Peale Research Natural Area
Manti-La Sal National Forest
N
Geyser Pass
to Moab
La Sal Pass
alpine vegetation
Mt Peale RNA - 2380 acres
main roads
MLNF Moab District
0 0.25 0.5 1 1.5 2 Miles
Manti-La Sal NF
BHS 11/09/07



Location of study plots for human impact assessment.

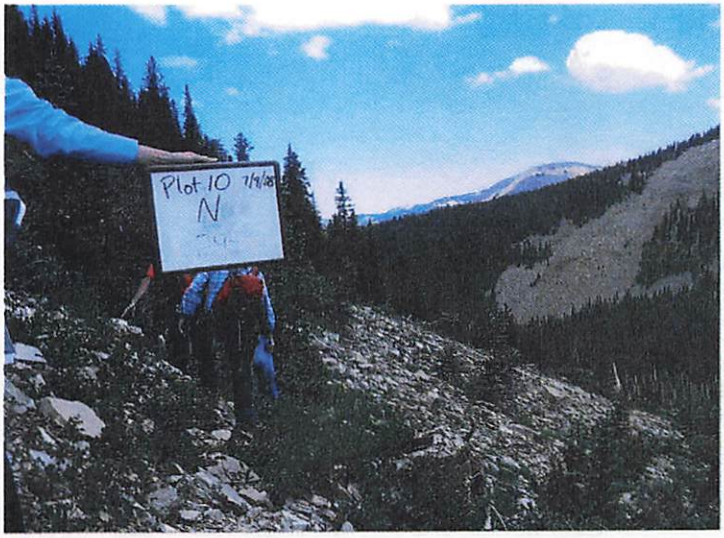


Location of *Androsace chamaejasme* patches in the Mt. Peale Research Natural Area.



Location of *Erigeron mancus* patches in the Mt; Peale Research Natural Area.

APPENDIX 2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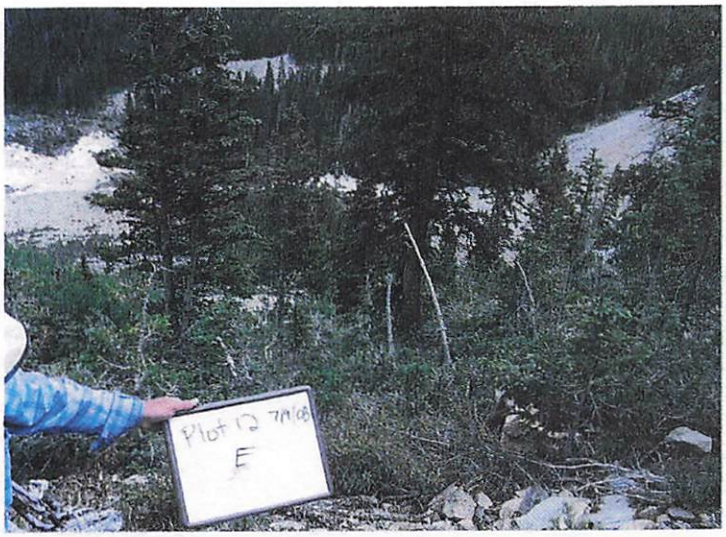
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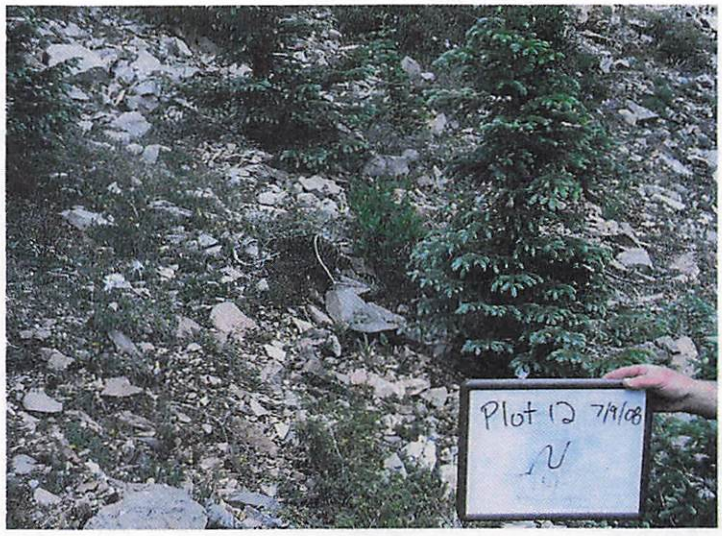
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Plot 14
7/11/08
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Plot 14
7/11/08
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Plot 15
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Plot 15
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Plot 16
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Plot 16
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Plot 17
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Plot 17
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Plot 19
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Plot 22
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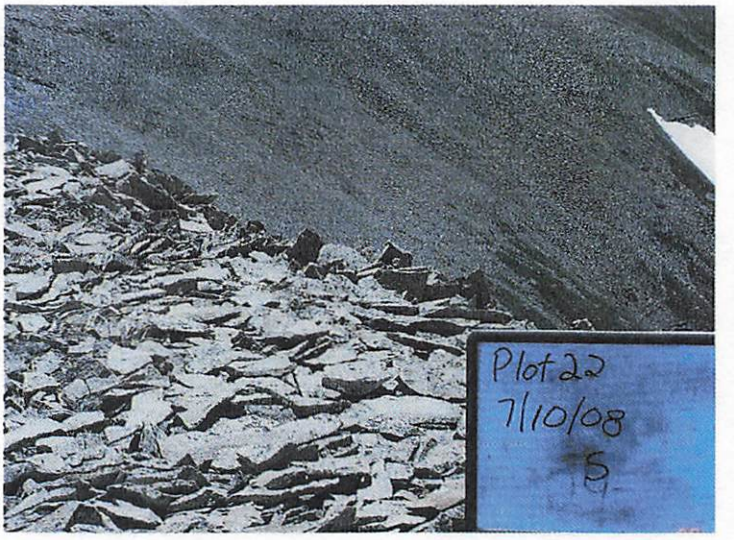
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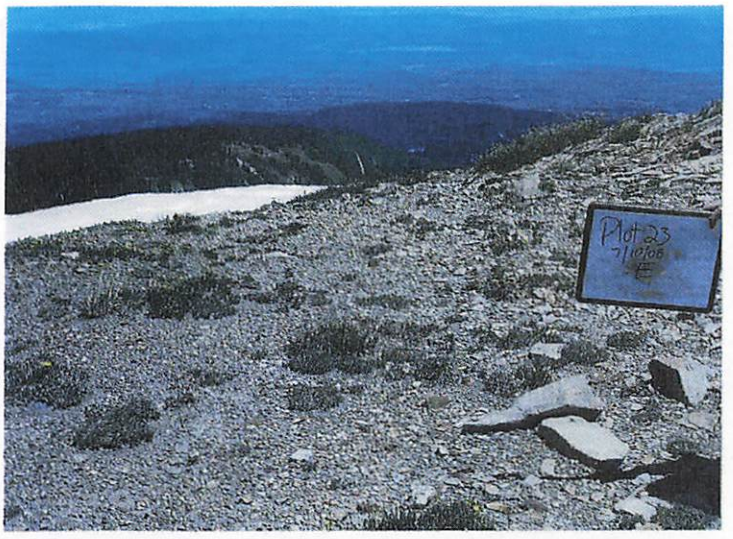
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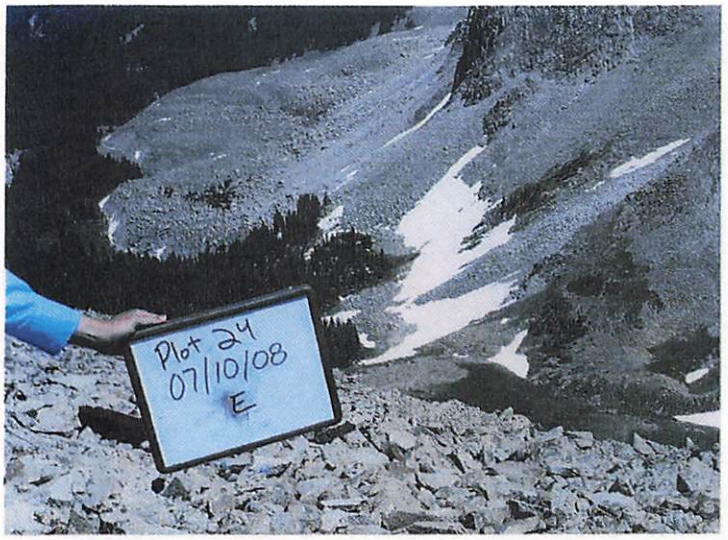
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