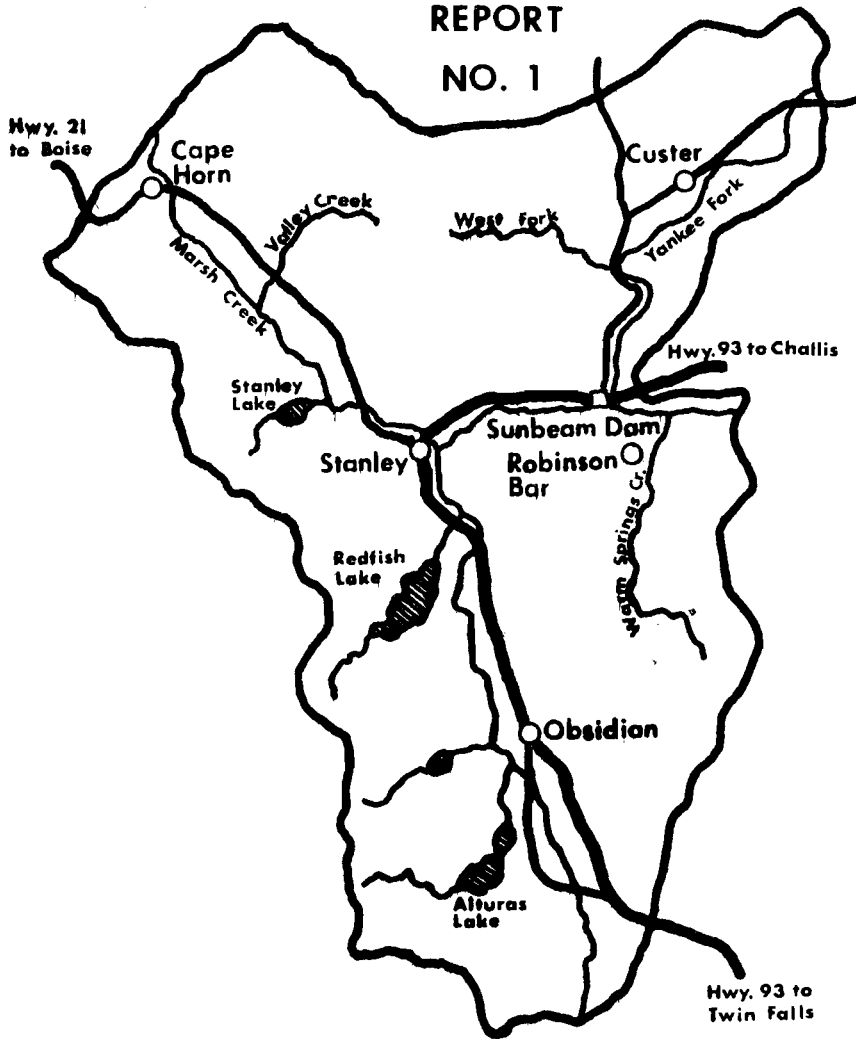




SCENIC RIVERS STUDY
REPORT
NO. 1



Report of
Vegetation Study

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ABSTRACT

This report evaluates the impact of recreational use in the Sawtooth Valley on the vegetation in the area. It is part of a recreational carrying capacity and economic impact study which is attempting to define managerial alternatives for the Sawtooth Valley. The overall study consists of an analysis of recreational use, a landowner survey, a hunter survey and this vegetative study.

The objectives of this study were to 1) describe the vegetation found in the Sawtooth Valley campgrounds, 2) describe the relative carrying capacity of various vegetative types for campground use, and 3) establish a managerial tool to quantitatively and qualitatively evaluate trends in the condition of selected campgrounds.

The method used was to divide the Sawtooth Valley into three management areas and select sites within campgrounds and describe the types and conditions of the vegetation. Photopoints were used to measure the conditions of the campsites. Ten sites were selected and a list of plants were made for each site and a general description of each site and adjacent area was indicated.

The study recommends that the approach developed should be continued for several years to provide a better basis for indicating campsite condition. Secondly, vegetative types should be used as a general planning tool for recreational carrying capacity and with particular emphasis for the location of new grounds and determination of location and number of campsites within new campgrounds.

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INTRODUCTION

The Water Resources Research Institute, University of Idaho, is conducting a carrying capacity study in connection with the proposal that the Sawtooth area be made a National Recreation Area. The study is progressing in three general directions: A recreational survey, a landowner survey and a vegetation study. The purpose of the vegetation study is to find biological indicators to estimate the impact of recreational use on the land resources in the Sawtooth area.

The vegetation survey is designed to give the land manager a relatively simple tool to use in making decisions about recreational use. Descriptions of vegetation types have been made and photopoints established in several campgrounds in different cover types. A quantitative as well as visual description of these sites has been made. Due to time constraints, the study is structured more as a reconnaissance than as a conclusive study. The study will be optimally utilized if the photopoints are retaken and comparisons made over the ensuing years.

OBJECTIVES

1. Description of vegetation types in the Sawtooth area campgrounds.
2. Description of relative recreational carrying capacity of various vegetation types for campground use.
3. Establish a management tool to quantitatively and qualitatively evaluate trends in condition of selected campgrounds.

METHODS

Time span of study

Field work for the vegetation study took place from July 15 to August 30, 1972. Although descriptions of the vegetation have been made, comparison of the sites cannot be made until remeasurements have been taken. No comparison between sites is made. The study is designed to describe trends over time as well as the relative recreational carrying capacities of various vegetation types. To obtain information on trends of campground condition, photopoints should be kept current (on a yearly basis) and quantitative measurements made at several sites.

Selection of study and control sites - Factors considered

The Sawtooth Valley was divided into three types of management area: Valley floor, middle ground and high country. The valley floor consists of all areas readily available to car campers. High country areas are accessible only by horse, trailbike or foot and typified by rocky ground and subalpine vegetation. Middle ground is that area in between the other two areas and consists of forest and sagebrush vegetation types on moraines and glacial outwash areas along with the steep hills left untouched by the glaciers. In general, it is inaccessible to four wheeled vehicles and not as outstandingly scenic as the high country.

Each study site is located within a campground, or in the case of the high country, within a campsite. Campgrounds receive heaviest recreation pressure and show site deterioration quicker than do areas that receive only occasional use. The sampled sites were representative of various vegetation types found in the Sawtooth Valley and representative of types and degrees of recreational use.

Relatively few people camp in the middle ground area as defined above. Generally, it is less than a four hour hike from where hikers leave their cars until they reach the high country. Most hikers prefer to travel more than a few hours once they have their packs set up and start up the trail. Hikers usually have goals in mind when they start hiking and middle ground is seldom a goal. Consequently, few sites are located in the middle area. Most of the camping sites are located on the valley floor and a smaller number area located in the high country.

In general, camping areas can be typified by use of people interested in particular activities. Some types of activity participants are semi-permanent summer campers, retirees, salmon fishermen, hunters and transient campers. For purposes of this report, semi-permanent campers would be defined as those that stay in a campsite for two or more days and who come for a specific reason. Semi-permanent campers could be divided into additional subtypes depending on the activity in which they are most interested and where they prefer to camp. For instance, water-skiers prefer Redfish Lake; hikers may prefer Stanley Lake or Iron Creek campgrounds. Transient campers are just passing through and usually stay for just one night.

Vegetative sampling sites also were selected by degree of use with heaviest use occurring in the highly preferred areas and light use being in the least preferred or special use (such as hunting) campgrounds. Because the salmon fishing season was cut short, camp sites previously used heavily by the salmon fishing recreationists were lightly used and began to be taken over by retirees.

The final factor considered in site selection was the vegetation type in which the campground was located. An attempt to avoid excessive duplication of vegetation types in the sample was made. In many areas sites ideal because of use patterns were rejected because they were located within an ecotone and thus unsuitable for purposes of this study.

For selected vegetation sites a control site was located nearby. A control site is as similar to the study site as possible except it is lightly used or unused.

Site Description

Sites are described in various manners. The location of the site is described by campground name (where applicable) and campsite number. In other cases references to nearby landmarks such as lakes, streams and trails are made. Within each site a pin, at least a quarter of an inch in diameter and eight inches long, is driven flush with the ground near a permanent or semi-permanent object, and its location is described. All plot descriptions and measurements are referenced to this pin.

The pin in each plot is a photopoint over which a 35 mm camera is hand held and slides taken of the site. Directions as to the aim of the camera are included in the site description.

A species list is made for each site and control. This list contains species within the photos and not necessarily in the general area. Quantitative measurements vary from site to site. There were no quantitative measurements made, either estimation of percentage ground cover by species or line transects. The reasons for the different quantitative measurements is to attempt to determine how difficult the quantitative measurements can be and still be followed up by the on-the-ground managers year after year. There are varying degrees of difficulty and time requirements for each of these measures. If these types of quantitative measurements fail, the photopoints should still remain useful management tools. Vegetation types were described using the system of plant classifications following Daubenmire and Daubenmire (1968) with refinements by Schlatterer (1972).

Methods of analysis

Comparisons of the study and control sites are made. Comparisons are between species composition and frequency of per cent of ground cover of species on study and control sites. These site descriptions will be accompanied by visual descriptions in the form of 35 mm slides. The design of the study does not allow for statistical analysis until remeasurements of the sites have been made, at which time analysis of variance or other statistical test could be made to indicate significant trends in condition of individual sites.

RESULTS

Schlatterer (1972) and Lewis and Riegelhuth (1964) have made preliminary descriptions of plant communities in the Sawtooth area. Daubenmire described the vegetation types of northern Idaho and eastern Washington, but the vegetation types of central Idaho are somewhat different. Therefore, while Daubenmire's technique of describing plant communities is used, his plant community descriptions themselves do not necessarily apply to the Sawtooth area. Identification of the vegetation types for this area is ongoing, and changes in the types as I have them listed can be expected. This study concerns mainly forest types as campers generally seek shelter from trees when setting up camp.

Study sites are located throughout the valley both in large campground and at single campsites. Sites are located at Stanley Lake, Salmon River, Sunny Gulch, Redfish Outlet, Redfish Transfer and Alturas Inlet Campgrounds. Vegetation types represented in this group of campgrounds are Lodgepole Pine/Idaho Fescue (Pinus contorta/Festuca idahoensis), Douglas-fir/Pinegrass (Pseudotsuga menziesi var. glauca/Calamagrostis rubescens), Subalpine Fir-Englemann Spruce/Bluejoint Reedgrass (Abies

lasioCARPA-Picea englemannii/Calamagrostis canadensis) and Spruce-Fir/Elk Sedge (A. lasiocarpa-P. englemannii/Carex geyeri). Sites located at single campsites in the middle ground and high areas include Iron Creek, Alice Lake and Fourth-of-July Lake. Plant communities represented at these sites are Spruce-Fir/Western Ledum (A. lasiocarpa-P. englemannii/Ledum glandulosa) and Subalpine Fir/Grouse-Whortleberry (A. lasiocarpa/Vaccinium scoparium). Vegetation types used in this report are as described by Schlatterer (1972).

Sites in campgrounds

Following is a description of the sites and a plant list to go with each site. Each site is described with the aid of the slides used for photopoints. These slides are numbered to coincide with the text and can be arranged in numerical order to be viewed.

Stanley Lake Site

The Stanley Lake sites are located in and near Stanley Lake Campground. The study site is located in unit 11, and the pin designating the photopoint is driven in the ground about six inches away from the west corner of the fireplace. The plant community appears to be the Douglas-fir/Snowberry type. During the prime camping season, about July 15 to September 10, the campground receives heavy use by semi-permanent campers.

Unit 11 was chosen because it was well within the type and should be little influenced by other types or by ecotones. Slides 1 and 2 show areas which receive heavy use from people, and slide 3 shows an area which receives little use.

The overstory consists entirely of a full canopy of small lodgepole pine with many stems per acre. Trees that have been cut down indicate that this is a slow growing stand. Trees average 3-7 inches diameter breast high.

Slide 1 taken at 220^o¹ (as measured from true north) indicates the damage done to the overstory by campers. Damage includes cutting and scarring of trees as well as wire and nails around the trunks used for various camping purposes. Well defined trails are present; but although the understory is depauperate, the litter cover is heavy enough to maintain a pleasing appearance and to keep the dust down.

Slide 2 taken at 180^o also shows the damage to trees, well defined trails, heavy litter and scarce understory. The understory is sparse in number of species present as well as in numbers of plants present.

Slide 3 taken at 60^o shows an area of comparatively little use, but the overstory has opened somewhat. Note that apparent damage to trees is lessened and that both numbers and diversity of understory has increased. This is probably due both to less trampling and to admission of more light.

Species present in the photographs include:

- | | |
|---------------------------|----------------------------|
| <u>Pinus contorta</u> | - Lodgepole pine |
| <u>Carex geyeri</u> | - Elk sedge |
| <u>Berberis repens</u> | - Creeping barberry |
| <u>Purshia tridentata</u> | - Bitterbrush |
| <u>Ribes cereum</u> | - Wax currant |
| <u>Sitanion hystrix</u> | - Bottlebrush squirreltail |
| <u>Oryzopsis exigua</u> | - Little ricegrass |

The lodgepole pine had 80-95 per cent canopy coverage while the understory coverage was less than 10 per cent. Species that occurred nearby, but not on the sites, included low sagebrush (Artemesia arbuscula) and Idaho fescue.

The control site is located by the gatepost on the south side of the road leading to Lakeview Campground. A pin is driven into the ground next to the post. Photographs were taken at 180^o (slide 4) and 120^o (slide 5) azimuths.

From the slides it is readily apparent that the understory coverage in this type was never very heavy but still is heavier and more diversified than in the study site. Note also the reproduction and sapling sized lodgepole pine. These

¹Please note that all slides referred to in the manuscript can be found in the Appendix.

are lacking in the study site. Slide 4 shows the understory when light is available, and slide 5 and the background of slide 4 shows how light the understory is under the lodgepole pine canopy. This indicates the effect of the heavier canopy.

Species present in the slides include:

<u>P. contorta</u>	- Lodgepole pine (reproducing)
<u>P. menziesii</u> var. <u>glauca</u>	- Douglas fir (rare, but reproducing)
<u>Purshia tridentata</u>	- Bitterbrush
<u>C. geyeri</u>	- Elk sedge
<u>Arenaria aculeata</u>	- Sandwort
<u>Phlox hoodii</u>	- Hood' phlox
<u>F. idahoensis</u>	- Idaho fescue (rare)
<u>R. cereum</u>	- Wax currant
<u>S. hystrix</u>	- Bottlebrush squirreltail (rare)
<u>O. exigua</u>	- Little ricegrass (rare)

The control site vegetation exceeds that in the study site in per cent coverage and species. It also has reproduction of both lodgepole pine and Douglas-fir which are lacking in the campground. In general it appears that the further away from the lake, the more typical this community becomes with more Douglas-fir in the overstory and snowberry and other understory becoming more common. More seral conditions close to the lake suggest that the community may be in an invasion process.

In general this community stands up quite well under heavy use. The lack of understory is partially made up by abundant litter production. The soils are fairly deep, and the relatively short season of use helps keep the condition of the site good. Natural selection as well as camper damage can be expected to thin out the overstory at which time the understory may increase and lodgepole reproduction may start. In this case the lack of understory may allow more dispersed use of the area than is found in many campgrounds. That is, people are not forced to stay on trails because of the heavy understory and, consequently, wander indiscriminately.

These plots include descriptions of study sites only as no control sites were available. The sites are located in the Salmon River Campground. This single campground contains a minimum of three plant communities. It is located on a bench along the Salmon River below Stanley. The soils are deep and moisture adequate; therefore, production of vegetation is good. It appears that lodgepole pine, representing a seral state of Douglas-fir/Snowberry (P. menziesis var. glauca/S. areophilus), has invaded a Big Sagebrush/Idaho fescue (Artemesia tridentata ssp. vaseyana/F. idahoensis) community and that the process of invasion is continuing. In addition, there is a meadow type in which campsites are also located.

The area receives heavy use during salmon fishing season by fishermen and by cattle in the spring and fall as they drift from winter to summer range and back. This year the campground received light recreational use due to early closure of the fishing season. As a result the pattern of use changed from approximately 200 per cent capacity by fishermen to less than 40 per cent capacity used mainly by retirees.

The first site is located by a pin located on the south side of the southwest barrier rock in unit 29. Photos were taken at 180° (slide 6), 90° (slide 7) and 30° (slide 8) azimuths. In photos number 6 and 7 note the heavy cover of litter, light understory and close canopy of lodgepole pine giving a pleasing appearance to the site. Due to the light use, even the parking and picnic table areas (slide 8) have a cover of litter. Thinning of the overstory should be expected both due to natural causes and damage by man and cattle. Slide 8 also gives a view of the three cover types within the camping area.

The species in the first three slides include:

<u>P. contorta</u>	- Lodgepole pine
<u>Rosa woodsii</u>	- Woods rose
<u>R. cereum</u>	- Wax currant
<u>Shepherdia canadensis</u>	- Russet buffaloberry
<u>Antennaria rosea</u>	- Rose pussytoes
<u>Achillea millifolium</u>	- Yarrow
<u>Potentilla glandulosa</u>	- Gland cinquefoil
<u>P. fruticosa</u>	- Bush cinquefoil
<u>C. geyeri</u>	- Elk sedge
<u>C. rubescens</u>	- Pinegrass
<u>C. canadensis</u>	- Bluejoint
<u>Phleum pratense</u>	- Timothy

Slide 9 shows a meadow type with a campsite located in it. The ground cover is heavy, low and matted so that species identification is difficult. It shows indications of heavy use by cattle and there is an abundance of tarweed (Madia sp.) indicating overuse. Other than that, site condition for camping does not seem severely impaired, although site production of vegetation may be impaired.

The site is located by the stake designating unit 26. The photo described above was taken from this position aiming the camera at 180°. Slide 10 was taken at 90° from the same point showing the Mountain Big Sagebrush/Idaho Fescue community. Note that the matted meadow type extends into the picnic and parking area and shows little site deterioration. Apparently, this type of community is very resistant to trampling.

Species present in the sage/fescue community includes:

<u>A. tridentata</u> var. <u>vaseyana</u>	- Mountain big sagebrush (abundant)
<u>P. tridentata</u>	- Bitterbrush (rare)
<u>F. idahoensis</u>	- Idaho fescue (rare)
<u>C. geyeri</u>	- Elk sedge
<u>Erigeron compositus</u>	- Fernleaf fleabane
<u>P. glandulosa</u>	- Gland cinquefoil
<u>A. millifolium</u>	- Yarrow
<u>A. rosea</u>	- Rose pussytoes
<u>Castilleja spp.</u>	- Indian paintbrush
<u>Chrysothamnus nauseosus</u>	- Rubber rabbitbrush

This community shows signs of heavy grazing use by cattle.

Slide 11 was taken at 320⁰ showing an area with no campsites present. The vegetation was essentially the same as described by the last two slides. On this slide note the abundance of bitterbrush on the hillside as opposed to the flat area. Note also the Douglas-fir that is beginning to invade the area. The seed source for Douglas-fir is from the top of the hill in this photo or from across the river.

Due to the deep soils, flat terrain and adequate moisture supply, this type of site appears to be well suited for campground use. The high productivity of the area and the flatness of the area makes it resistant to use. With a little help, it should recover rapidly from overuse. The amount of litter produced by the lodgepole pine keeps the appearance of the campsites up and probably mixes with soil enhancing infiltration and keeping compaction from being as severe as it might be. The sagebrush is thick enough to discourage walking across sagebrush areas, and the matted meadow type is evidently resistant to compaction.

Sunny Gulch Site

This site is located in the Lodgepole Pine/Idaho Fescue community in which the lodgepole pine is in the early stages of invasion. It is located in Sunny Gulch Campground at unit 9. A line transect has been run between units 9 and 10. The pin locating the plot is driven in the ground approximately 6 inches off the north end of the west bench of the picnic table.

Species in this area include:

<u>P. contorta</u>	- Lodgepole pine
<u>F. idahoensis</u>	- Idaho fescue
<u>A. arbuscula</u> ssp. <u>thermopola</u>	- Thermopola low sagebrush
<u>C. rubescens</u>	- Pinegrass
<u>P. tridentata</u>	- Bitterbrush
<u>S. hystrix</u>	- Bottlebrush squirreltail
<u>A. aculeata</u>	- Sandwort
<u>P. hoodii</u>	- Hood's phlox
<u>Frasera montana</u>	- Small frasera
<u>A. rosea</u>	- Rose pussytoes
<u>A. millifolium</u>	- Yarrow
<u>Lupinus agrenteus</u>	- Silvery lupine

The control line transect is located by pacing approximately 200 feet at 146° from the pin marking the start of the first transect. A pine under a rock cairn marks the beginning of this transect. Slide 13 shows a thin ground cover but it appears to be heavier and certainly less disturbed than the study site. This photo is taken at 191° from the starting pin along the transect. Each transect is 100 feet long.

Following is a comparison of the two transects:

<u>Species</u>	<u>Study Transect</u> <u>% Cover</u>	<u>Control Transect</u> <u>% Cover</u>
<u>A. arbuscula</u>	2	14
<u>P. tridentata</u>	3	--
<u>F. idahoensis</u>	14	13
<u>A. rosea</u>	1	2
<u>A. aculeata</u>	Present	1
<u>P. hoodii</u>	Present	1
<u>S. hystrix</u>	Present	1
<u>F. montana</u>	Present	--
Rock	Present	--
Bare Ground	15	20
Litter	62	46

-- - will not add 100% due to rounding

Present - present indicates less than 1% coverage

The comparison of line transects brings out some surprising observations in view of the photos and what would be expected. These observations may be changed if a more intensive sample is taken.

There was a significant increase in A. arbuscula in control site. Bare ground was about equal in both areas, but the amount of litter in the study transect was larger than in the control area. The study site had 77 per cent bare ground and litter, while the control site had 66 per cent bare ground and litter. All plants in the study site appear to be low in vigor, and the area was substantially disturbed by trampling and firewood activity. The plants in the control site appeared to have normal vigor.

The campground is located on the top of a moraine above the river. The soils were deep but rocky. Even with low to moderate use, the area showed signs of deterioration. Conditions were dusty even after light use. This site under this plant community appears not to be well suited to campground use, unless the use is extensive.

Redfish Outlet Site

This site is located in Outlet Campground in Redfish Lake. The pin designating the photopoint is in unit 23 driven off the north corner of the fireplace. This unit was chosen because of the uniformity of vegetation type and availability of a control site. As close as can be determined, it is a Subalpine Fir/Elk Sedge (A. lasiocarpa/C. geyeri) community. The campground is very popular and receives heavy use by semi-permanent campers.

Slide 14 taken at 340° is of an area that appears to be mutually utilized by both units 21 and 23. Vegetation is mainly Elk sedge with some pinegrass. Slide 15 taken at 60° shows young lodgepole pine, a campsite covered with litter and nice stand of pinegrass with individual plants in good condition. Slide 16 taken at 100° and slide 4 taken at 160° show more of the campsite. This site is in good condition. Lodgepole pine reproduction is present.

Species in these four slides include:

<u>P. contorta</u>	- Lodgepole pine
<u>C. rubescens</u>	- Pinegrass
<u>C. geyeri</u>	- Elk sedge
<u>B. repens</u>	- Creeping barberry
<u>L. argenteus</u>	- Silvery lupine
<u>P. tridentata</u>	- Bitterbrush
<u>Penstemon attenuatus</u>	- Sulphur penstemon

The next two slides were taken across the road from the campsite and about 100 feet in from the road. Here reproduction of lodgepole pine, Douglas-fir and subalpine fir can easily be found. The understory cannot be called lush and yet it is not sparse. Here, pinegrass dominates the understory but Idaho fescue is also common.

The species list includes:

<u>P. contorta</u>	- Lodgepole pine
<u>P. menziesii</u>	- Douglas-fir
<u>A. lasiocarpa</u>	- Subalpine fir
<u>C. rubescens</u>	- Pinegrass
<u>F. idahoensis</u>	- Idaho fescue
<u>C. geberi</u>	- Elk sedge
<u>B. repens</u>	- Creeping barberry
<u>L. argenteus</u>	- Silvery lupine
<u>P. tridentata</u>	- Bitterbrush
<u>P. attenuatus</u>	- Sulphur penstemon
<u>A. aculeata</u>	- Sandwort

This community is not typical of anything described by Schlatterer (1972) but may come out as a distinct type in the future. The soils are deep here and there is apparently adequate moisture available. This site is apparently hardy and resistant to campground pressures as evidenced by limited trampling and overstory reproduction in spite of heavy use.

Redfish Transfer Site

The site is located in the southwest unit of the Redfish Transfer Camp. A pin is driven about six inches southwest of the southwest table bench towards the creek. The camp probably receives light to moderate use of the transient variety. The vegetation type is probably Douglas-fir/Pinegrass, although this is confused by the presence of subalpine fir. The subalpine fir may have been introduced by the Spruce-Fir/Ledum community along the creek.

Slide 20 taken at 100° shows the open characteristic of the overstory and the heavy understory. Slide 21 taken at 270° shows the same thing, but shows better the diversification of understory species.

Species in this area include:

<u>P. menziesii</u>	- Douglas-fir (reproducing)
<u>P. contorta</u>	- Lodgepole pine (reproducing)
<u>A. lasiocarpa</u>	- Subalpine fir
<u>C. rubescens</u>	- Pinegrass
<u>Symphoricarpus oreophilus</u>	- Snowberry
<u>R. cereum</u>	- Wax currant
<u>Aster ssp.</u>	- Aster
<u>Hieracium albertinum</u>	- Hawkweed
<u>Balsamorhiza sagittata</u>	- Balsamroot
<u>Agastache occidentalis</u>	- Horsemint
<u>Arnica cordifolia</u>	- Heartleaf arnica
<u>A. millifolium</u>	- Yarrow
<u>P. gracilus</u>	- Northwest cinquefoil
<u>B. rosea</u>	- Rose pussytoes
<u>B. repens</u>	- Creeping barberry
<u>Epilobium angustifolium</u>	- Fireweed

As mentioned earlier there is some doubt that this community is properly named. It comes very close to belonging to several communities and may be an ecotone. This type appears to be relatively hardy; but deep soils and adequate water supply may help this site, whereas the same plant community on the other sites may not exhibit this hardiness.

Alturas Inlet Site #1

This site is located in unit 5 of the Alturas Inlet Campground. The photo-point is the water spigot post to the north of the campsite. Englemann Spruce-Subalpine Fir/Bluejoint (Picea englemannii-A. lasiocarpa/C. canadensis) is the plant community represented here. Use is moderate as the wet ground forces the season of use to be shorter than other campsites. Use is by semi-permanent campers.

Slide 22 taken towards the campsites shows the lush understory and moderate overstory. Although the vegetation is trampled down over the campsite, the main deleterious effect may be some compaction of soils. There is no apparent deterioration at the present. Grasses are the dominant understory.

Species included in this area:

<u>P. contorta</u>	- Lodgepole pine (reproducing)
<u>P. englemannii</u>	- Englemann spruce (reproducing)
<u>A. lasiocarpa</u>	- Subalpine fir (reproducing)
<u>C. canadensis</u>	- Bluejoint reedgrass
<u>P. pratense</u>	- Timothy
<u>Lonicera involucrata</u>	- Bearberry honeysuckle
<u>Salix ssp.</u>	- Willow
<u>E. augustifolium</u>	- Fireweed
<u>Thalictrum ssp.</u>	- Meadow rue
<u>Fragaria ssp.</u>	- Strawberry
<u>P. gracilus</u>	- Northwest cinquefoil
<u>Gentian calycosa</u>	- Gentian
<u>Pedicularis groenlandica</u>	- Elephant head lousewort
<u>Smilacina racemosa</u>	- Fat soloman plume

Slide 23 taken at 180^o from the first indicates the extent to which grasses dominate this site when undisturbed.

This site is located in low, flat, deep soils along Alturas Inlet Creek. The site is very productive, but is not useful as a campsite early in the season because it is so wet. The site appears to be hardy for camping use.

Alturas Inlet Site #2

Located in unit 24, the photopoint is marked by a pin driven between the two big center driveway rocks. The type appears to be Subalpine Fir/Snowberry (A. lasiocarpa/Symphoricarpus oreophilus), but it is difficult to be certain because the site is in such poor condition. It probably receives heavy use as it is one of the few dry campsites in the campground.

Slide 24 shows the lack of ground cover on the site as well as scarring of the overstory. Slide 25 shows the depauperate condition of the plants in the area and how the litter produced is incorporated into the soil.

Species present include:

<u>P. contorta</u>	- Lodgepole pine
<u>A. lasiocarpa</u>	- Subalpine fir
<u>P. englemannii</u>	- Englemann spruce
<u>Juniperus communis</u>	- Common juniper
<u>S. canadensis</u>	- Russett buffaloberry
<u>P. pratense</u>	- Timothy
<u>Vaccinium scoparium</u>	- Grouse whortleberry
<u>Fragaria ssp.</u>	- Strawberry
<u>Solidaga multiradiata</u>	- Low goldenrod
<u>C. geyeri</u>	- Elk sedge
<u>A. millifolium</u>	- Western yarrow

This site flowers and sets seed more rapidly than the other site and is much too dry for the understory to recover readily from trampling. The soil is deep and coarse so there should be no difficulty with compaction. This site is not hardy from a vegetation standpoint. With watering the vegetation could be much more resistant to recreational use.

Individual Sites

Iron Creek Site

This site is located across Iron Creek from the junction of Iron Creek and Alpine Way trails. It is the only well used campsite in the vicinity. It is in a Subalpine Fir-Englemann Spruce/Western Ledum type and receives light to moderate use. It appears to receive its heaviest use during hunting season. The photopoint is located approximately four paces away from the table at 60° and is marked by a pin in the ground.

Slide 26 is taken at 200° shows the area of recreational impact. Although understory vegetation is sparse, there is overstory reproduction present and an adequate cover of litter to give the site a pleasing appearance. Slide 27 taken at 0° shows an area of little to no use and how the understory would look if there was no disturbance by campers.

Species present include:

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<u>P. contorta</u>	- Lodgepole pine (reproducing)
<u>A. lasiocarpa</u>	- Subalpine fir (reproducing)
<u>P. englemannii</u>	- Englemann spruce (reproducing)
<u>V. scoparium</u>	- Grouse whortleberry
<u>S. oreophilus</u>	- Snowberry
<u>R. montigenum</u>	- Gooseberry currant
<u>L. involucrata</u>	- Bearberry honeysuckle
<u>Salix</u> ssp.	- Willow
<u>C. geyeri</u>	- Elk sedge
<u>C. rubescens</u>	- Pinegrass

If this site is representative of this vegetation type, it appears that the vegetation is susceptible to trampling; but the site holds up well under light to moderate use. Other than lack of understory and man's abuse (other than normal camping use) of the overstory, there is no appreciable deterioration of the site.

Alice Lake Site

The Alice Lake site is located between the main trail and the north side of the lake next to what I will refer to as the main horse camp. There is a small meadow and several other campsites nearby. I called the vegetation the Subalpine Fir/Grouse Whortleberry type even though red mountain heather (Phyllidoce empetri-formis) is abundant. This site appeared to receive moderate use, at least compared to the other sites in the same vegetation type nearby.

Slide 28 is a general view of the campsite taken from the meadow. This photo shows Phyllidoce encroaching on the area. The photopoint for the following slides is a rock to the north of the campsite. Slide 29 shows the campsite, and slide 30 taken at 180° from slide 29 shows an unused area.

The control area has close to 100 per cent ground cover while the campsite itself has less than 50 per cent cover. Other differences in the sites are that sickletop pedicularis (P. racemosa) and grouse whortleberry (V. scoparium) are

rare in the campsite, and the Antennaria spp. present in the campsite does not appear to be reproducing. It appears that this site is moderate in resistance to camping pressure; but other than a lack of vegetation, there is little site deterioration under moderate use. However, sites that receive concentrated use lose their vegetative cover and litter cover and are not as desirable. They become dirty and dusty campsites with a fire ring as shown in slide 31.

Fourth-of-July Lake Site

This site is located on the north side of the lake in a Subalpine Fir/Grouse Whortleberry type. It is one of the better campsites around the lake and probably receives moderate to heavy use. Slide 32 shows the campsite looking northerly.

Species present include:

<u>V. scoparium</u>	- Grouse whortleberry
<u>C. geyeri</u>	- Elk sedge
<u>Antennaria</u> spp.	- Pussytoes

Slide 33 also taken at a northerly direction shows a control site just across the main trail from the campsite. In addition to appreciable increase in ground cover, it contains the additional species of:

<u>P. empetriformis</u>	- Red mountain heather
<u>Orthocarpus luteus</u>	- Yellow owlclover
<u>Dodecatheon jeffreyi</u>	- Jeffrey shootingstar
<u>F. idahoensis</u>	- Idaho fescue (rare)
<u>Erigeon</u> spp.	- Fleabane

The grouse whortleberry in either site is not in good condition. The area as a whole has the appearance of being overgrazed, but other sites in this area that are not grazed give the same appearance. In the campsite Antennaria is the major species while in the control site Phyllodoce is the major species. In the control site Antennaria is flowering and healthy looking, whereas this species is not flowering and appears flattened in the campsite. The elk sedge in the campsite is also in poor condition.

DISCUSSION

Nature of study

Because of time limitations the vegetation study is a reconnaissance study. Vegetation types are in the preliminary stages of identification and only one season was allotted to gather data. Vegetation types in which campgrounds are located are recorded and the apparent hardness of the sites is discussed. In order for the study to be more useful, it should be continued and time series data of vegetative sites should be recorded and compared. This will give the land manager a perspective of the trends of campground condition. This can then be related to degrees and type of use and resistance of vegetation types to recreational use.

Shortcomings of available data

For the purposes of this study there was not enough base information available on which to base firm conclusions. A preliminary description of plant communities in the Sawtooth area was not published until after the field work was completed, making it difficult to identify the plant communities I was working with. The plant community classification used for this study, therefore, should be considered as tentative.

Campgrounds are not always built within vegetation types but often are constructed in ecotones or cross types. The major factor influencing a camp's location usually is not the vegetation type but rather its relative nearness to water and shelter. Choosing areas to study then becomes more difficult.

Type and degree of use of campgrounds and individual sites is not known, so estimates must be made by the investigator. And these estimates are made

without a solid information base of the area. It is not known whether these patterns of use have changed over time; or if they have, whether the changes were sudden or subtle. This type of information is needed to make good time trend comparisons.

Literature review

Magill and Nord (1963) evaluated the conditions and needs for research in selected California campgrounds. They identified several types of site deterioration, the major ones being: 1) Inadequate forest stocking, 2) insufficient accumulation of plant litter to cover mineral soil, 3) increased susceptibility to insect and disease damage, and 4) disturbed sites due to trampling and erosion.

Frissell and Duncan (1965) studied campsite deterioration in the Quetico Superior Canoe Country and found that campsites lost 57-99 per cent of their original ground cover and that there was little difference in this respect between light use and heavy use areas. They also noted a lack of tree reproduction within the camping areas as well as damage caused by campers seeking firewood, tentpoles, etc.

Trampling causes a heavy loss of ground cover. The extent of the loss is related to the intensity of the first years use according to Lapage (1967) who studied sites in northwestern Pennsylvania. Species composition is gradually rearranged with compaction and drought resistant species becoming more abundant. In an earlier study (1962) he found that a decrease in site quality is accompanied by a decrease in aesthetic attraction as well as increased compaction and a decrease in tree growth.

A test of comparative durability of various vegetation types in Utah was run by Cieslinski and Wagar (1970). They used a "trampling machine" on various

test plots and developed regression coefficients explaining variations between plots and types so that predictions of relative durability could be made.

As far back as 1945 Lutz did a soils study in Connecticut parks concerned with recreation use. He stated that although trampling obviously and immediately decreases the density of the understory, the associated soil changes which are less obvious may be more important. He found significant changes detrimental to plant growth in volume-weight, pore volume and infiltration rates. However, if soils are left to rest, they may be restored through frost heaving and the shaking of trees loosening the soils.

Frissell and Duncan indicated losses or reductions in litter and humus due to recreational use. They suggest that sites should not be expected to look undisturbed and that with adequate rest periods they ought to be naturally restored.

Changes, or lack of changes, in overall sites were mentioned by Scott-Williams (1965). Rare plants were found growing right next to well planned trails indicating that recreationists were not straying off the main trail as long as it was well planned. However, in alpine areas campsites along trails caused more damage to native vegetation proportionate to the amount of use. This is aggravated even more by recreationists choosing new campsites instead of using old ones.

Magill (1963) points out that while data recorded at the time of plot establishment does show some change related to intensity of use, the significance of this change cannot be determined until the plots are remeasured at later times. He also suggests that ecological trend plots be established in some areas years before campgrounds are constructed and used.

According to Wagar (1965) there are two alternatives for rehabilitating recreation sites. One is to physically protect the vegetation through barriers, fences and other management techniques, while the other is to apply cultural

treatments to help the site recover. Treatments discussed by Wagar are: Watering to permit establishment of grasses which are much more durable than forbs and to increase total growth of vegetation and to aid in recovery of vegetation that has been bruised or crushed by trampling; fertilization supplies nitrogen, phosphorus and trace elements often deficient in forest lands (treatment response of ground cover tends to be just opposite of the overstory, i.e., water benefited the trees more than the understory); and thinning should be done in such a manner that while crown cover is reduced, shading is not reduced.

Point Campground on Redfish Lake, Sawtooth National Forest, was the site of an experiment by Herrington and Beardsley (1970). They rejuvenated the campground using treatments of a) grass seed only, b) seed and fertilizer, c) seed and water, and d) all three. They had marked responses in revegetating the campground. Time required to attain a 70 per cent cover were estimated as follows in the same order of treatment as mentioned above: a) never, b) at least 20 years, c) at least 10 years, and d) at least 3 years.

Preference of recreationists' use of vegetation types was mentioned by several authors. Michaud thought that human patterns of use should be assessed to relate effective management to the wants, desires and behavior of people who take to the woods. Frissell and Duncan found that undeveloped campsites were located mainly in the red pine type and this was probably preferred because of the open park-like understory. Preference for certain vegetation types in the Sicily Isles was shown by various methods tested by Goldsmith, Morton and Warren (1970). They also pointed out that weather influenced the pattern of use of recreational areas.

Site selection and location of facilities to make better use of hardy vegetation types and increase visitor satisfaction is discussed by Michaud. He notes that location of facilities in the heaviest stands of pine and hardwood soon present

an appearance comparable to heavily grazed woodlots with heavy use. He feels that if the same facility were put among a few trees in a meadow area, vegetative deterioration would not be as severe as meadow grasses are highly resistant to trampling. Amount of sunlight as well as vegetation type has an effect on durability of sites. In Indiana resource managers now recommend location of facilities in areas with 50 per cent or less overstory.

Goldsmith, et. al., noted that trampling may be desirable in some types to keep out unwanted species and retain the grasses in areas where grazing pressures have been alleviated.

Both Magill and Michaud recognized that with heavy use and decreased vigor, trees become more susceptible to insect and disease damage; but some species are more resistant to the effects of trampling than others. Magill notes that certain shrubs species that are tough, thorny, brittle or grow in dense stands control movement of recreationists and protect the understory and tree reproduction.

Ramifications of differences between study and control plots

The differences in study and control plots in the Sawtooth areas show the study sites to have a fewer species and a definite reduction in ground cover. This indicated that whenever there is camping use, whether light or heavy, a reduction in vegetation should be expected.

Not enough data was obtained to identify species that are more resistant to use in each type, but observations from this summer indicate that this could be done. It appears that some of the more resistant species are Carex geyeri, Vaccinium scoparium, Achillia millifolium and Antennaria rosea. Species such as Chionophila tweedyi, Festuca idahoensis, Calamagrostis rubescens and Phlox hoodii either disappear from use sites or diminish in numbers and become low in vigor and stature. One of the first indicators of over-use is lack of overstory reproduction.

This type of information probably is not too important as far as individual camp-sites are concerned as normal wear and tear is to be expected. However, if a general area shows these symptoms, some management action should be taken,

Vegetation types and carrying capacity

This subject will be better pursued after remeasurements of the sites have been made. In addition, better information as to visitor-days use of the sites and general area will have to be known before relative carrying capacity of the sites can be observed. Observations of the field season indicate that those sites with flat, well-drained soils with an adequate water supply maintain themselves well. The heavier soils of the area (more silt and clays) seem best able to support recreational use. Tentatively, sagebrush types and the Lodgepole Pine/Idaho Fescue type usually occurred on coarse soils on moraines, glacial outwash and terraces in the Sawtooth Area. The combination of these soils, sparse understory and inadequate moisture makes this type more susceptible to deterioration relative to other types in the area. Following is a tentative list of the vegetation types arranged in order of increasing resistance to trampling;

Least Resistant	Lodgepole Pine/Idaho Fescue
	Douglas-fir/Elk Sedge-Snowberry
	Subalpine Fir/Elk Sedge
	Douglas-fir/Snowberry
	Subalpine Fir/Snowberry
	Douglas-fir/Pinegrass
	Subalpine Fir/Grouse Whortleberry
	Subalpine Fir-Englemann Spruce/Western Ledum
Most Resistant	Englemann Spruce-Subalpine Fir/Bluejoint
	Reedgrass

Time of year

In the early portion of a plant's growing season, it is lush and easily damaged by trampling. It usually is able to rebound from crushing and bruising several times before succumbing. After a plant has set seed, it becomes increasingly

hardy and trampling may not affect it substantially. In the Alturas Lake sites, site 2 is probably used more during the early part of the vegetations' growing season as this site is much drier than site 1 and, therefore, more attractive to early camping. Not only is the season of use shorter on site 1, but it does not get used until the vegetation is past its early stages of growth. Therefore, it is in better condition to resist trampling.

The high country receives use as soon as the snow is off the ground enough for hikers to get in. The heaviest use is from mid-July through August. The short growing season, plus continued trampling of vegetation during the crucial growing part of the plants' life makes recreational use especially hard on these sites.

In general different sites are used for hunting than for other forms of recreation. These sites, although used for about the same length of time each mainly due to two factors: The vegetation has had time to cure, and sometimes the sites are protected by a cover of snow.

Management Objectives

Carrying capacity is also dependent on management objectives and expenditures on planning and management of sites. If the objective of management is to provide space for as many people as wish to camp around a lake, management will be much different than if the lake is kept in as natural a condition as possible. Management objectives could include allowing natural succession to take place, arresting a site in its present stage of succession or returning a site to a more seral condition. A site which presently has a lodgepole pine overstory and grouse whortleberry understory may eventually become a Douglas-fir/Snowberry type. This latter may not be as aesthetically pleasing or easy to manage as the former, so cultural

practices to arrest successional advance could be used. For extremely heavy use sites native vegetation may be removed and more resistant species introduced. These are but a few examples of how the management objective can determine the carrying capacity of a site.

Campground placement

Although existing campgrounds are placed in most vegetative types having a conifer overstory in the Sawtooth area, they are not placed with a particular vegetation type in mind. Placement more likely depends on relation to streams, rivers or lakes, activities, attractions, shelter, water supply or a demand placed on an unimproved area as indicated by heavy use. Of these, shelter is the main reason that campgrounds may be located in a specific vegetation type.

Vegetation types can serve as indicators of site durability, soil type and condition and groundwater conditions. Therefore, vegetation should be an important parameter in campground location planning - perhaps the most important parameter. Frissell and Duncan noted that the people they interviewed did not have a clear idea of what they preferred as a campsite. Although the majority of campsites were located within the red pine type, people consistently listed other factors as being more important than vegetation in selection of campsites. Therefore, it seems that campgrounds could be located in the more durable sites as indicated by vegetation type and people would still use them.

CONCLUSIONS

A preliminary description of plant communities in selected campgrounds has been made. The description of plant communities should not be considered anything but tentative until a more thorough study of plant communities in central Idaho has been completed. Campgrounds are often not constructed within a single vegetation type, but are often found in cross types or in ecotones. This makes selection of study sites for plant community studies difficult.

Plant communities can serve as a general indicator of a site's resistance to trampling. Therefore, use can be made of vegetative types as a planning tool for recreation management. A tentative order of site durability by vegetation type is given.

For use as a management tool the deterioration of vegetation or change in species composition on individual campsites is not too critical an indicator of overuse. It may be that maintenance of a plant community in a more seral condition than it presently is would be desirable from a recreation management point of view.

Use of photopoints is a valid management tool, but only as long as the photos are taken at approximately the same time of year. Photos are much more reliable than memory when looking for past condition of a campground and are useful for making visual comparison of trends in campground condition.

Because vegetation condition in the general area is the best indicator of campground condition, a plant list and per cent cover by species estimate for the general area should be made. This will allow comparisons between sites to be made as well as trends in campground condition. Campground condition is an important function of management objectives as some objectives will condone more deterioration or hardening of sites than will others.

For some campgrounds both plant lists and photopoints should be used. On some sites such as campgrounds located in ecotones or heavily grazed areas, photopoints will be sufficient.

RECOMMENDATIONS

The study should be continued by the U.S. Forest Service personnel to make best use of the information gathered. The first part of August is the best time to retake photopoints and a series of photos comparing campground conditions over time should be started. It would be more helpful to use the same photopoint, but take photos in at least four directions for better comparisons of overall site condition. It would also be helpful to obtain more complete plant lists for some of the areas, specifically the Stanley Lake site, Sunny Gulch site and Redfish Outlet site. These lists should include ocular estimations of frequency (rare, common, abundant) per cent ground cover by species and per cent cover by litter, bareground and rock.

Vegetation types should be used as a general planning tool for recreational carrying capacity. When more is known about plant communities and recreation use, they will become an important planning tool. It should be recognized that while vegetation is a function of physical carrying capacity, management objectives (degree of deterioration tolerated, intensity of management, hardening of sites, use of exotic vegetation, etc.) is probably a more important variable in a formula for recreational carrying capacity.

In the future campground planning should include relation to vegetation types. Vegetation types are gross indicators of site durability, water supply, soil type and groundwater conditions. Durability as indicated by vegetation type is also a means to aid planning the density of campsites for a given management level.

PLANT LIST FOR
THIS REPORT

Trees

<u>Abies lasiocarpa</u>	-	Subalpine Fir
<u>Picea englemannii</u>	-	Englemann Spruce
<u>Pinus contorta</u>	-	Lodgepole Pine
<u>Psuedotsuga menziesii</u> var. <u>glauca</u>	-	Douglas-fir

Shrubs

<u>Artemesia arbuscula</u> spp. <u>thermopola</u>	-	Thermopola Low Sagebrush
<u>A. tridentata</u> spp. <u>vaseyana</u>	-	Mountain Big Sagebrush
<u>Chrysothamnus nauseosus</u>	-	Rubber Rabbitbrush
<u>Juniperus communis</u>	-	Common Juniper
<u>Lonicera involucrata</u>	-	Bearberry Honeysuckle
<u>Potentilla fruticosa</u>	-	Bush Cinquefoil
<u>Purshia tridentata</u>	-	Bitterbrush
<u>Ribes cereum</u>	-	Wax Currant
<u>R. montigenum</u>	-	Gooseberry Currant
<u>Rosa woodsii</u>	-	Woods Rose
<u>Salix</u> spp.	-	Willow
<u>Shepherdia canadensis</u>	-	Russet Buffaloberry
<u>Symphoricarpus oreophilus</u>	-	Snowberry
<u>Vaccinium scoparium</u>	-	Grouse Whortleberry

Forbs

<u>Achillea millifolium</u>	-	Yarrow
<u>Agastache occidentalis</u>	-	Horsemint
<u>Antennaria rosea</u>	-	Rose Pussytoes
<u>A. spp.</u>	-	Pussytoes
<u>Arnica cordifolia</u>	-	Heartleaf Arnica
<u>Arenaria aculeata</u>	-	Sandwort
<u>Aster</u> spp.	-	Aster
<u>Balsamorhiza saggitata</u>	-	Balsamroot
<u>Berberis repens</u>	-	Creeping Barberry
<u>Castilleja</u> spp.	-	Indian Paintbrush
<u>Dodecatheon jeffreyi</u>	-	Jeffrey Shootingstar
<u>Epilobium angustifolium</u>	-	Fireweed
<u>Erigeron compositus</u>	-	Fernleaf Fleabane
<u>Erigeron</u> spp.	-	Fleabane
<u>Fragaria</u> spp.	-	Strawberry

Plant List (cont.)Forbs (cont.)

<u>Frasera montana</u>	-	Small Frasera
<u>Gentian calycosa</u>	-	Gentian
<u>Hieracium albertinum</u>	-	Hawkweed
<u>Lupinus argenteum</u>	-	Silvery Lupine
<u>Orthocarpus luteus</u>	-	Yellow Owlclover
<u>Pedicularis groenlandica</u>	-	Elephant Head Lousewort
<u>Penstemon attenuatus</u>	-	Sulphur Penstemon
<u>Phyllodoce empetiformis</u>	-	Red Mountain Heather
<u>Phlox hoodii</u>	-	Hood's Phlox
<u>Potentilla glandulosa</u>	-	Gland Cinquefoil
<u>P. gracilus</u>	-	Northwest Cinquefoil
<u>Smilacina racemosa</u>	-	Fat Soloman's Plume
<u>Solidago multiradiata</u>	-	Low Goldenrod
<u>Thalictrum spp.</u>	-	Meadow Rue

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APPENDIX



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Slide #4

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Slide #6

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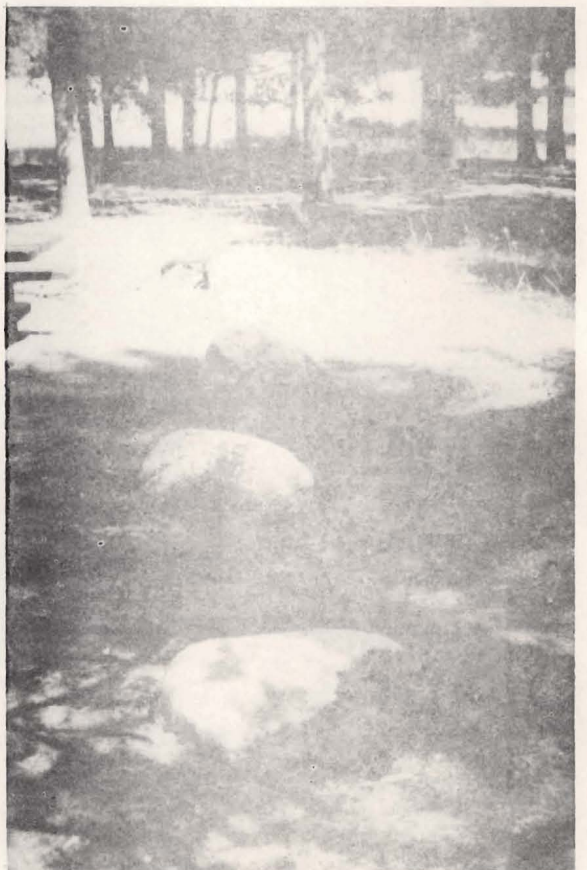
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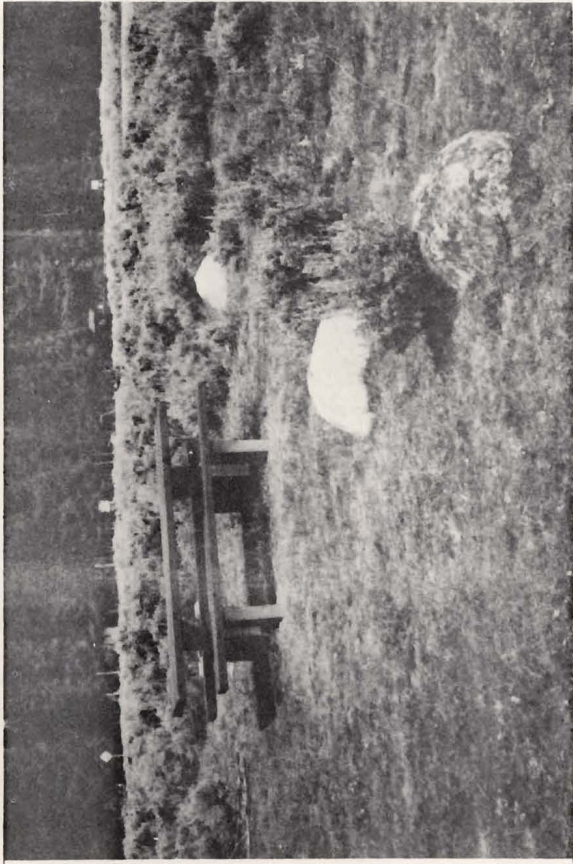
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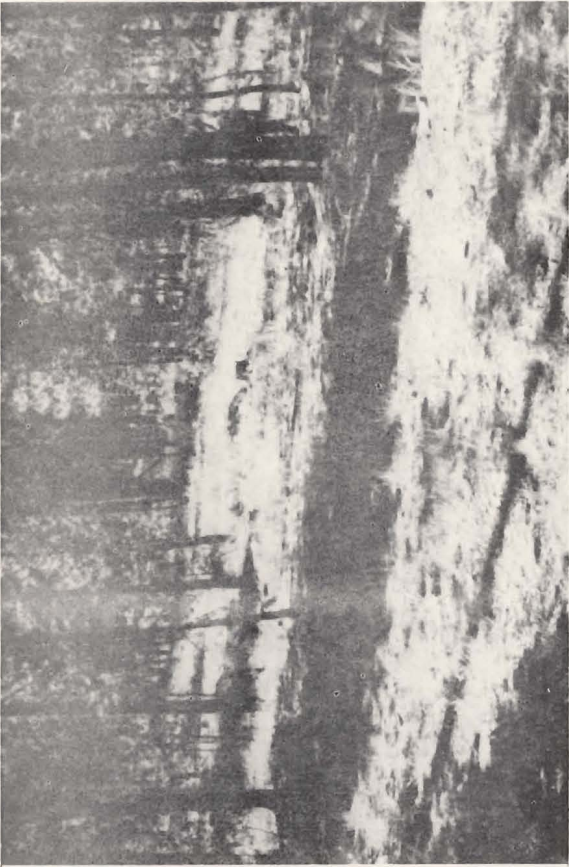
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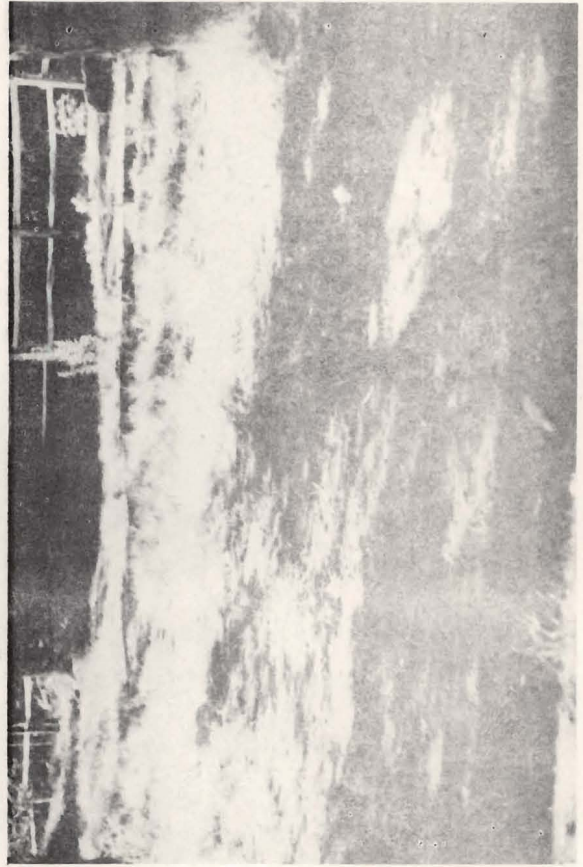


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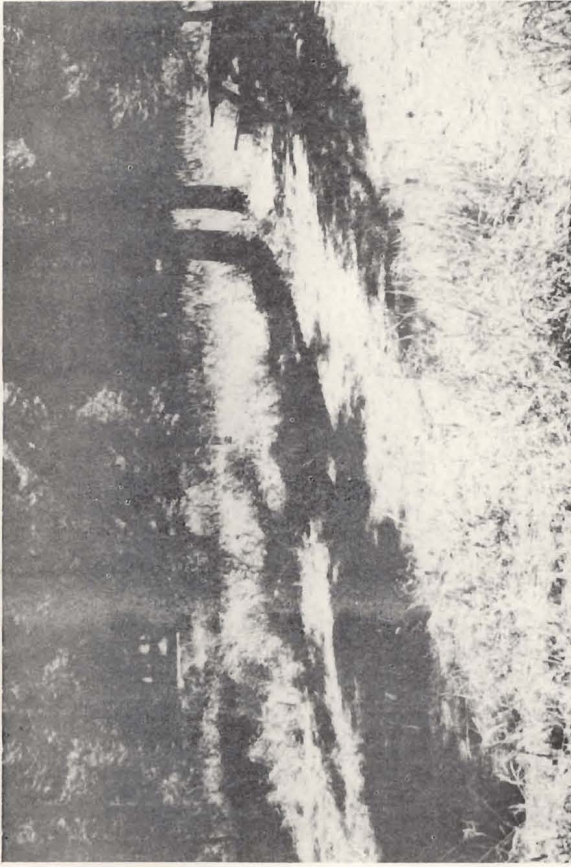
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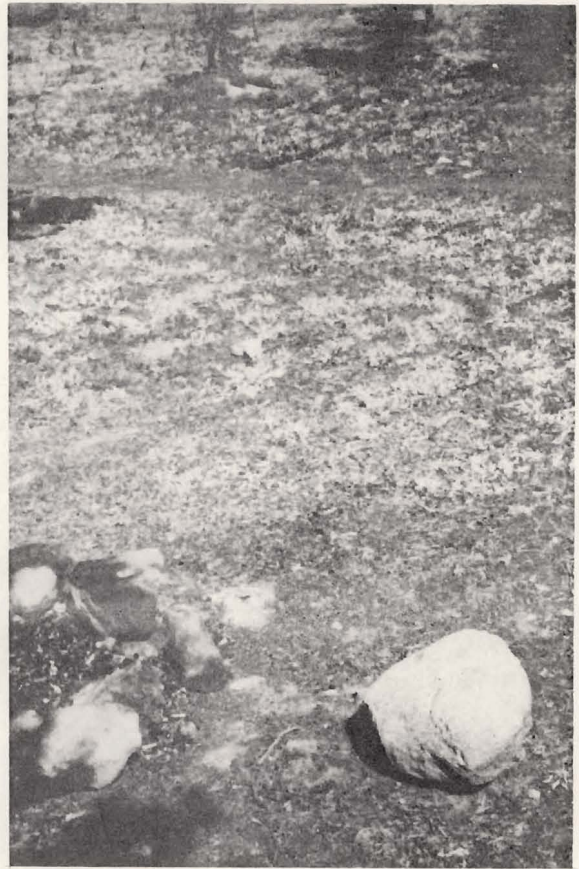
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