BOULDER MTN PARKS

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Trail Condition And Use Documentation

Boulder Mountain Parks

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OSMP Studies 4380
Study

4380

CITY OF BOULDER
PARKS & RECREATION

Fall 1983

TRAIL CONDITION AND USE DOCUMENTATION - FALL 1983
BOULDER MOUNTAIN PARKS

I. INTRODUCTION

During the summer of 1983, it was noted that little formal documentation of the condition and location of marked and unmarked trails exists for the Boulder Mountain Park system. Therefore, this mapping and trail inspection project was begun. The primary goal was to document the location and condition of existing trails (both planned and unplanned). Secondly, to survey use patterns on the trails in Chautauqua Meadow. The final goal of the project was to use the extensive field observations obtained to recommend future trail maintance needs and priorities.

II. PROCEDURE

Extensive mapping of social trails was accomplished in six high use areas of the park. The resulting maps of these areas are shown in Appendix A. Social trails are those distinguishable paths that have not been designated by the Mountain Parks Department (ie. they do not appear on published maps and no signs have been posted along them). Simple base maps were drawn initially by enlarging sections of the appropriate USGS quadrangle and tracing relevant features. Recording of the social trails was done in the field with the aid of the base map and compass. All of the trails appearing on the maps were walked and measured by counting of standard walking strides. Therefore, measurments are not extremely accurate . However, the trails do exist in very close proximity and length to what is represented on the maps. By using different symbols, the maps also denote the difference between well worn and less worn social trails.

Total miles of social trails and total miles of designated trails have been recorded for each map. These figures as well as totals for all six maps are shown in Appendix B. The trail milages were calculated with the aid of an Apple IIe computer and the Graphics Tablet attachment. Again, distance measures are approximate due to the slight inaccuracy of the initial measurements mentioned above.

In some areas, where trails were extensively braided, all the existing trails do not appear on the maps. The map scales were not large enough to allow a clear graphic representation of these areas. Therefore, the final mileage counts of the social trails are conservative.

Use figures and patterns were recorded in the Chautauqua Meadow area during five weekend days. Appendix C contains a complete description of the procedures used and the data that was obtained.

Specific trail condition observations were recorded during the mapping field work. Additional observations concerning all of the park trails were recorded during the summer and fall of 1983.

III. AREA REPORTS

Flagstaff Summit.

This area suffers from a proliferation of badly eroded social trails that lead from the summit parking areas to the Boy Scout Trail (see Appendix A #1). Many of these trails have become drainage paths for the runoff from the summit parking areas. These paths cut straight down the mountain which increases the erosion potential of the runoff water. Numerous social trails also exist in the Artists Point area.

Another problem in the area is the Tenderfoot Trail. The latest edition of the Colorado Mountain Club map of Boulder hiking trails shows the Tenderfoot Trail as a loop. The western switchback of the trail before it meets Chapman Drive is very hard to find. The trail near the logging road is not signed and several spur trails lead to dead ends.

In the Flagstaff Summit area, high use and the nature of the soil make the erosion problem very great.

Flagstaff Mountain (below the summit).

The most notable problem in this area is north and south of Crown Rock (refer to Appendix A #2). These areas sustain high use by climbers and picnickers. Multiple trailing to the same objective is common. Many of the social trails are steep and loose. They may warrant erosion control improvements. A second problem area is the lower Flagstaff trail. Old waterbars have filled in and the ensuing erosion has caused deeply gullied sections. A short section here has been worked by the 1983 Junior Ranger crew by constructing steps, waterbars and replacing fill to raise the treadway.

Chautauqua Meadow.

The Chautauqua Meadow area is a very highly used area (see Appendix C and Appendix A #3). It has a great number of unneeded social trails. The effect of these social trails is mostly visual however. Except for the trails on the western edge of the meadow, erosion is not a problem. Many of these trails exist because of confusion by the visitors. Lack of adequate signs telling visitors where the major trails go is a problem. The present lack of erosion means that many of these trails could be closed simply by seeding, slashing, and signing.

Flatirons Area (including Woods Quarry and Royal Arch).

This area appears to include the greatest problems in the entire park. Social trails leading to the First and Third Flatirons are many (refer to Appendix A #4). The

confusion experienced by visitors attempting to reach these rocks is great. Most of the trails are severely eroded and very steep and loose. In this area there is approximately four times the length of unmarked trails as compared to marked trails (refer to Appendix B). It has been found that on a given weekend day, this area sustains as much use as the high use trails in Chautauqua Meadow (see Appendix C).

In the Woods Quarry area, many social trails are also present. The largest and most distinct trail leads from the Quarry, west to the Royal Arch Trail. This path is steep, loose and eroded. The wide and deep treadway makes it appear to be a heavily traveled route. The designation and maintance of this route has been suggested in the past.

The Royal Arch Trail has been worked extensively by the Junior Ranger crews in 1982 and 1983. Yet, there are sections which have not been completed that exhibit erosion problems. The extreme upper end and sections on the lower switchbacks should be looked at.

The Flatirons area in general receives high use by people seeking objectives well off the designated trails, most notably, climbers. Due to the very steep slope and absence of maintenance, a proliferation of dangerous social trails has occured.

Enchanted Mesa Area.

The north part of Enchanted Mesa area (see Appendix A #5) has two problems. First, there are numerous social trails in the area. Most of these trails run across contours and could have erosion problems in the future. The second problem in the area is that of signs along the McClintock Nature Trail. Between the Chautauqua trailhead and the eastern entrance, the trail crosses several major social trails. Signs at these intersections could aid visitors and reduce the traffic on the social trails.

N.C.A.R. Area - West.

In this section there are two notable problems. First, the Mallory Cave trail has severely eroded and widened on its upper end. A braid of steep and loose paths exists in this area. There has been no erosion control work done here. Secondly, the social trails west of the Mesa Trail near Skunk Canyon and south, are very steep and loose (see Appendix C #6). There are multiple paths leading to the same objective; the climbing rocks. Finally, it is worth mentioning the trails that parallel the Mesa Trail to the east of the trail and to the north of Skunk Canyon. These are well defined trails that simply go to the same places that the Mesa Trail goes.

Bear Peak and South Boulder Peak (including the canyons).

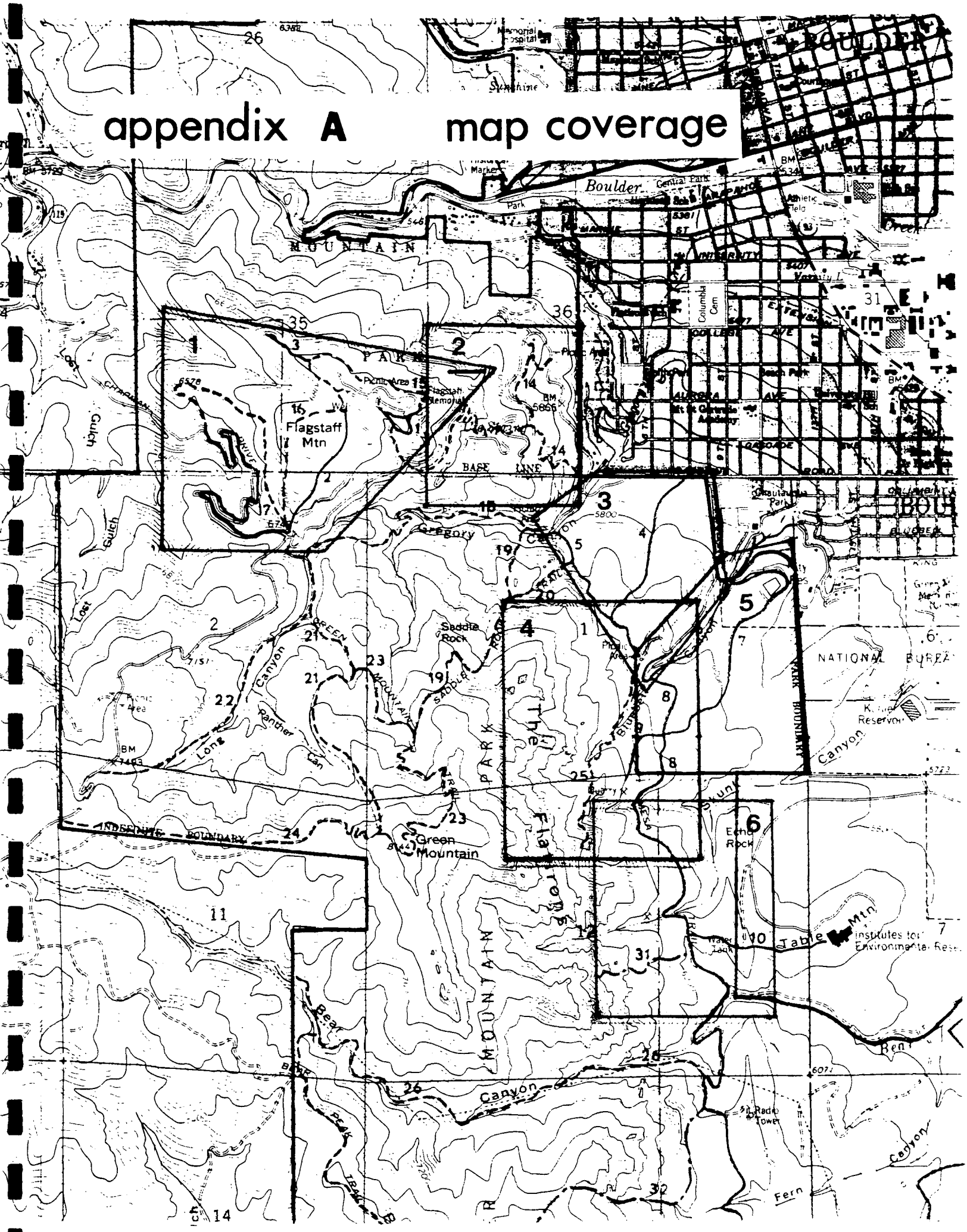
This is a large area with two similar problems.

First, on both the Fern Canyon and Shadow Canyon designated trails, erosion and trail widening has become extreme. The upper ends of both trails, below the ridge saddles, are steep, loose and wide. Eroded gullies exist on both trails and no trailwork has been done on the upper sections. The antithesis of this problem exists on the West Ridge of Bear Peak and on the north shoulder of South Boulder Peak. These trails are indistinguishable, yet they appear on the CMC public issue map. The West ridge is a problem to negotiate for approximately 300 yards down a scree slope. The entire route from the ridge up to South Boulder Peak is unclear with occassional signs appearing only to the seasoned orienteer.

Green Mountain.

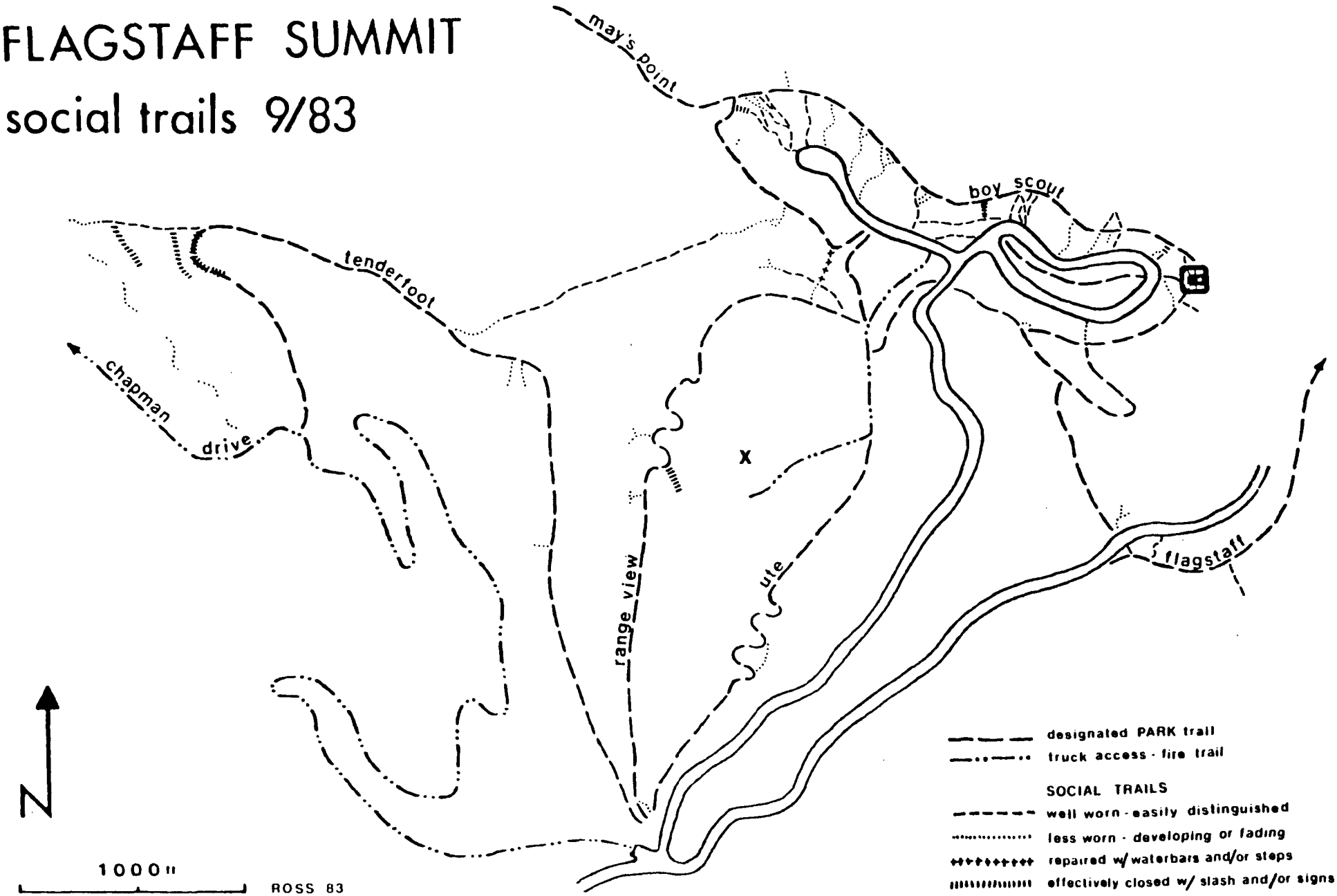
The Green Mountain area has recieved extensive trail work in the past. Green Mountain West Ridge Trail, Greenman Trail, and Ranger Trail have all been worked on. Continued maintance needs to be done on the erosion control structures already in place to prevent erosion damage along these trails. The lower section of the Green Mountain West Ridge Trail will need erosion control and slope stabilization in the near future. Also, the intersection of Greenman Trail and the logging road is very confusing. Numerous visitors miss the cutoff to Ranger Trail and follow the road to the Gregory Canyon Trail intersection instead.

appendix A map coverage



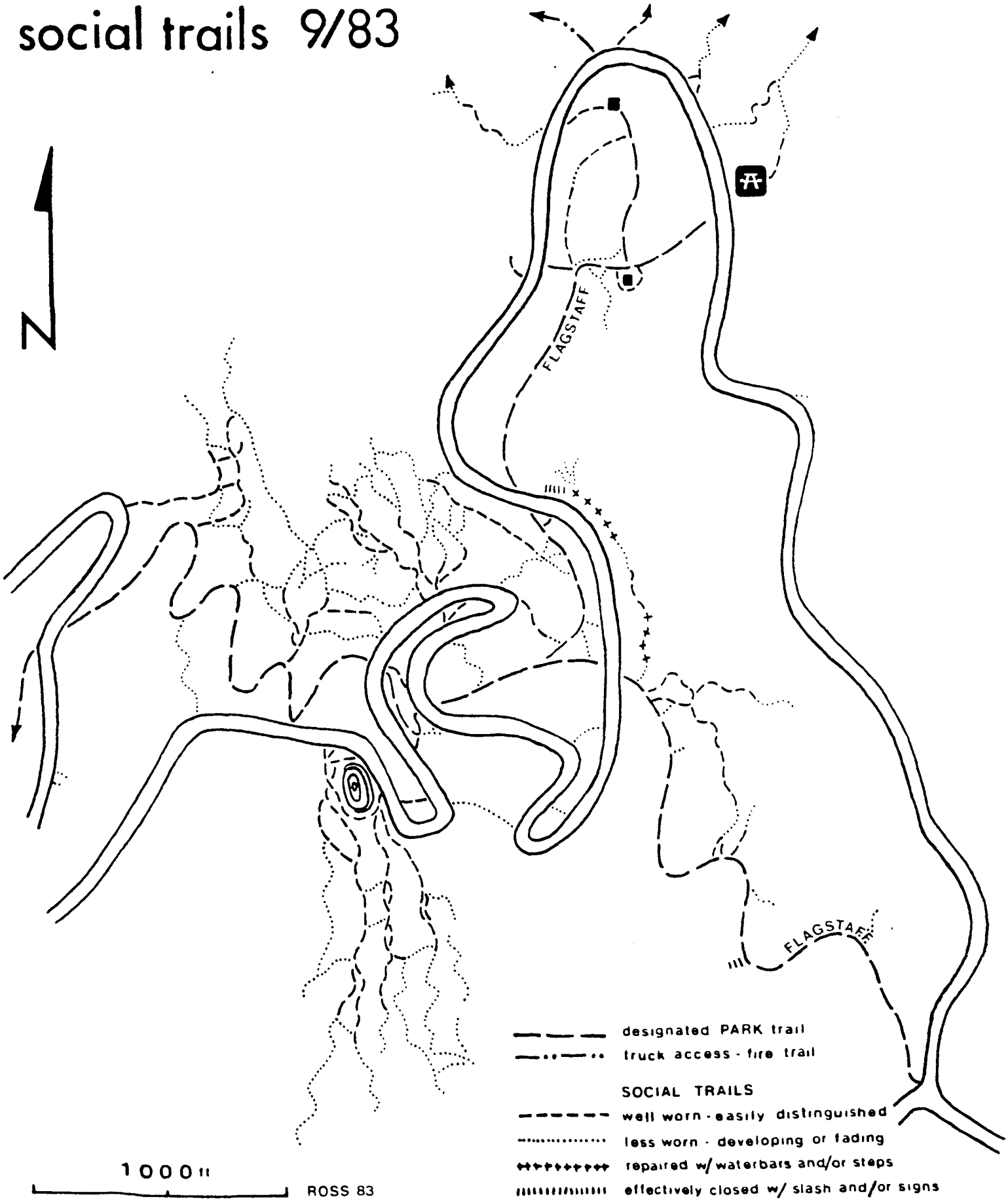
1

FLAGSTAFF SUMMIT
social trails 9/83



FLAGSTAFF MOUNTAIN 2

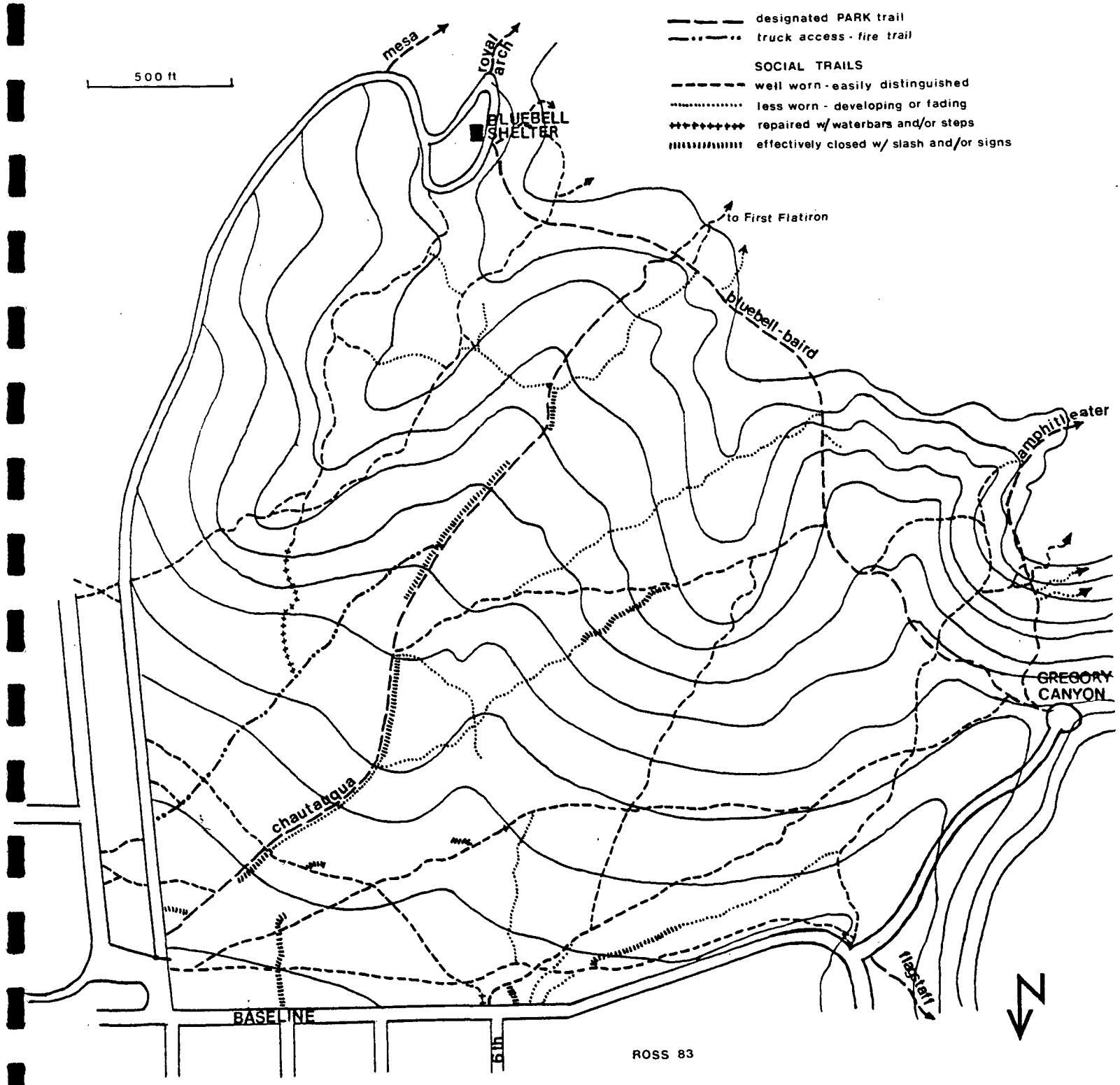
social trails 9/83



CHAUTAUQUA MEADOW

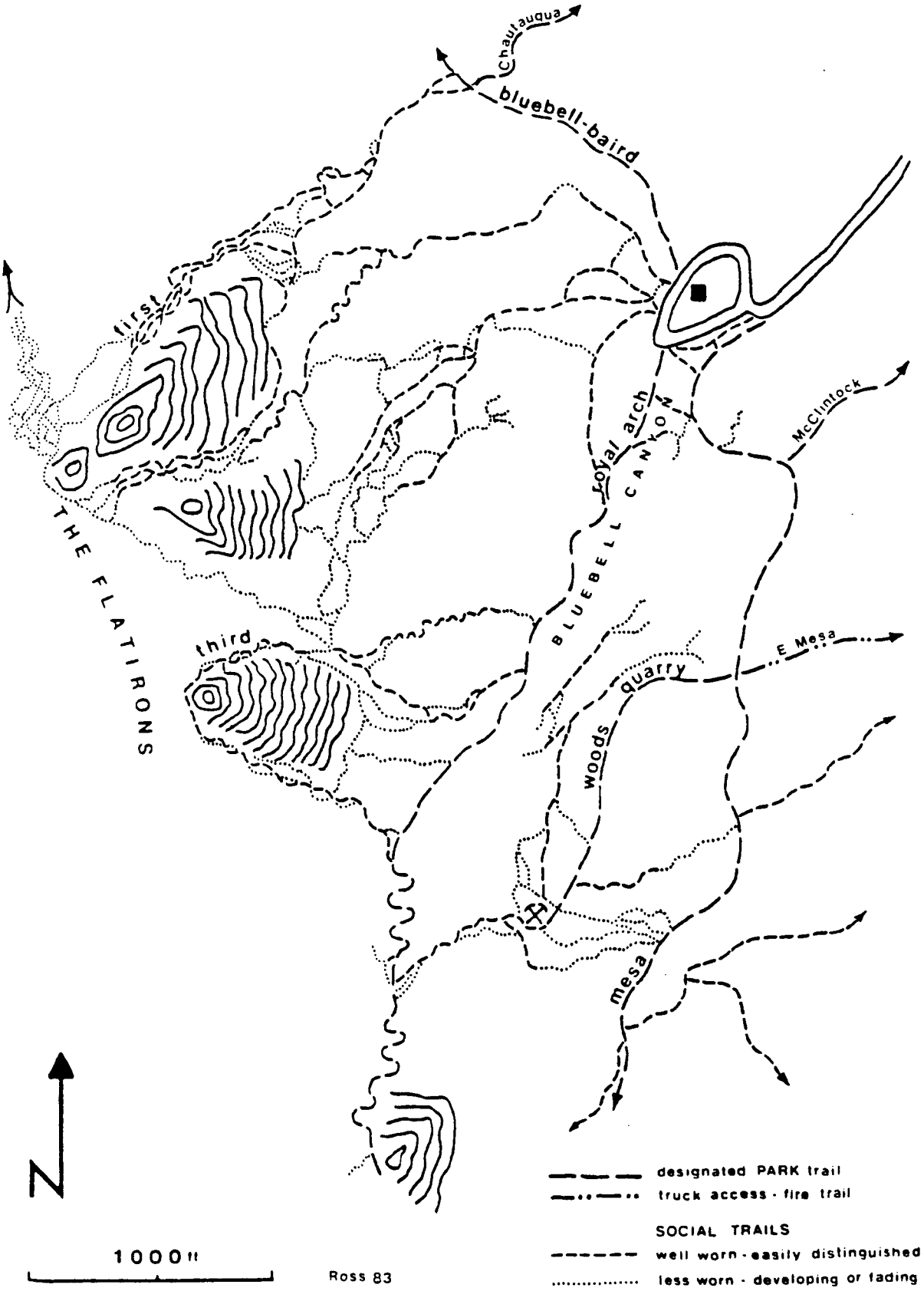
3

social trails 9/83



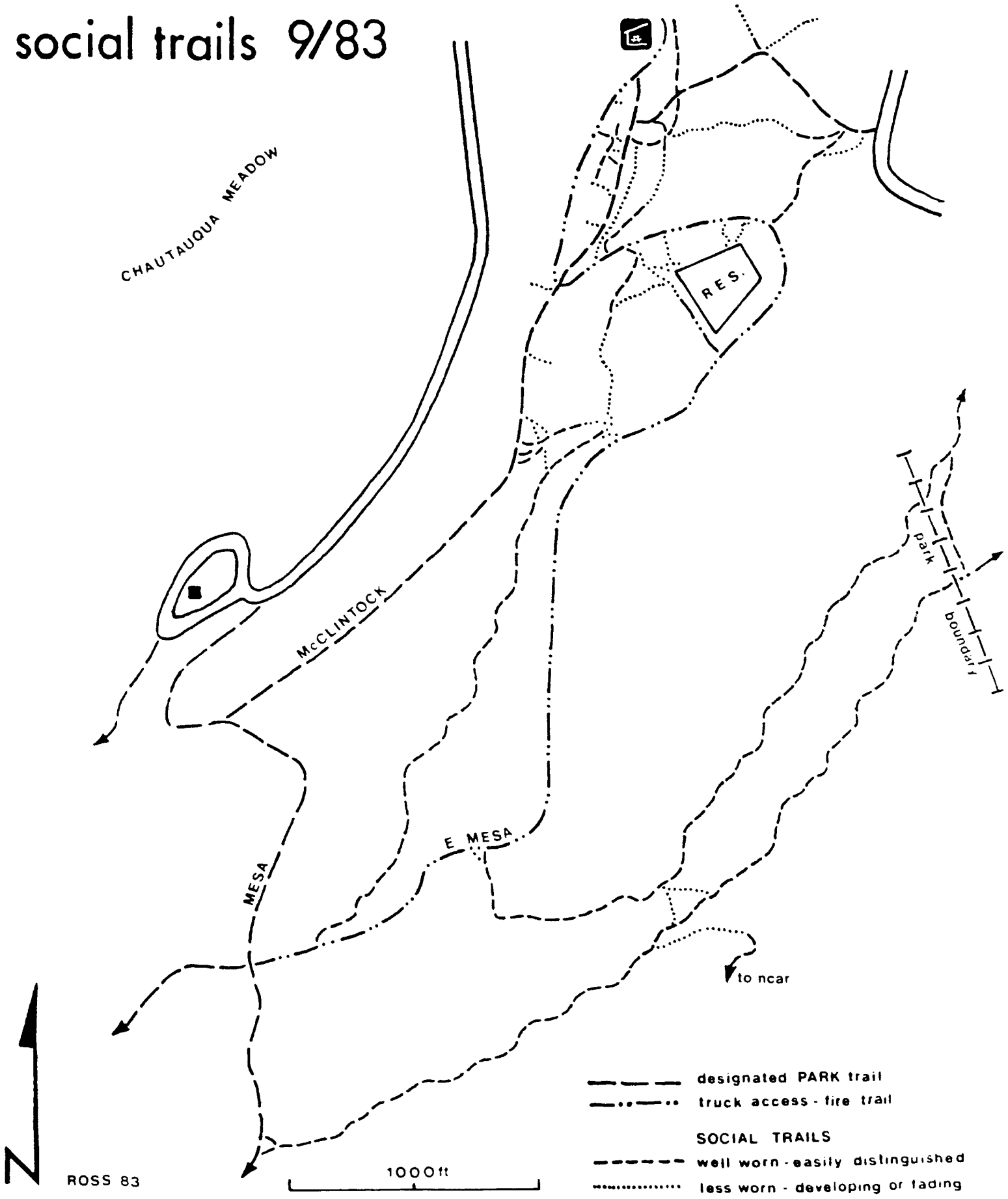
FLATIRONS & BLUEBELL CANYON

social trails 9/83



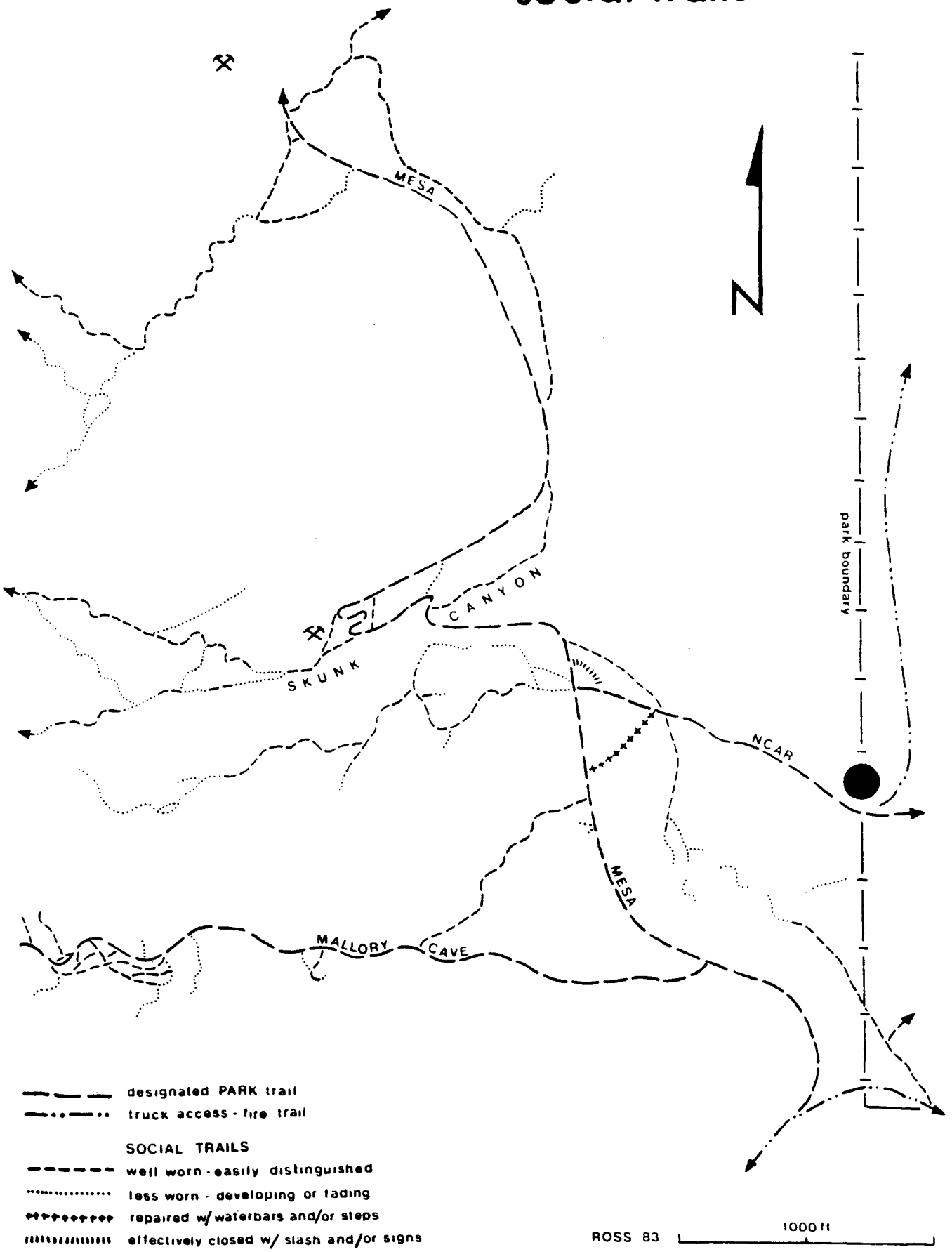
E. MESA & McCLINTOCK AREA 5

social trails 9/83



6 NCAR AREA – WEST

social trails 9/83



APPENDIX B. MILAGE FIGURES OF SOCIAL TRAILS AND DESIGNATED TRAILS IN THE MAPPED AREAS.

AREA	DESIGNATED TRAILS	SOCIAL TRAILS
Flagstaff Summit	4.4 miles	1.7 miles
Flagstaff Mountain	1.9 miles	6.0 miles
Flatirons Area	2.3 miles	7.8 miles
Chautauqua Meadow	1.4 miles	5.6 miles
Enchanted Mesa	2.8 miles	3.5 miles
N.C.A.R. Area - West	2.2 miles	4.1 miles

appendix C

USE COUNTING IN CHAUTAUQUA MEADOW -- SUMMER-FALL '83

Explanation of Procedure-

The problem of resource damage in the Chautauqua Meadow due to human impact has continued into the eighties. In response to this the City Forester has initiated an informal program of counting users to determine where and how the impact is concentrating. This data may serve to justify administrative closures and newly designated trails in the Meadow.

The counting procedure denotes where people enter the area, what they are doing there and where they proceed to. Two counting tables are used in conjunction with a keyed map (see attachments). Normally only one counter/observer is on duty and only on weekend days (high use periods). The observer is positioned at the lower Bluebell Road gate. From here approximately 60% of the Meadow can be seen and hikers can be seen on approximately 80% of the major social trails.

In Table I the number of people entering the given locations are noted. One counter cannot observe all the major entry points. Therefore, #4 denotes those entering from an undetermined location. This should be understood to indicate probable entry from the high use points along Baseline Road. Also in this category would be the small percentage of people entering by off trail hiking (bushwacking). The total of Table I is simply the number of people seen by the observer during the hours of counting.

In Table II the type of visitor use is correlated with the area(s) being used. It is important to note that an assumption of use in certain areas may be valid without an actual observation by the counter. Three quadrants must be considered in this way since they cannot be seen by the counter. People usually enter Quad F from Bluebell Road (above) or from Quad E (below). It can be assumed that users proceeding out of sight through Quad E (if they do not return promptly) have proceeded into F. Similarly, previously unobserved users descending through E may be assumed to have come from F. The two other quadrants to note are H and I, the Flatirons. Most climbers approach the Flatirons by standard routes in this lower area. Climbers hiking up the Bluebell Road can be assumed to enter Quad I via the standard approaches to the Third Flatiron. Climbers hiking up the Chautauqua trail can be

assumed to enter Quad H via the standard approaches to the First Flatiron. A small number of people are interviewed by the counter to determine where they are going or where they have been. The total of Table II will usually be greater than the total number of people observed reflecting the fact that one user may proceed through several Quads.

Five day total:
8/27+28, 9/3, 5+10
8-10 hr. day counts

Tables for Counting

4 entry locations

#1 Chautauqua Tr.
#2 Fire Road
#3 Bluebell Rd. proceeding past Fire Rd.
#4 Undetermined (other social trail)

#'s of people	entry location
500	#1
215	#2
617	#3
437	#4

Total 1769

5 types of use

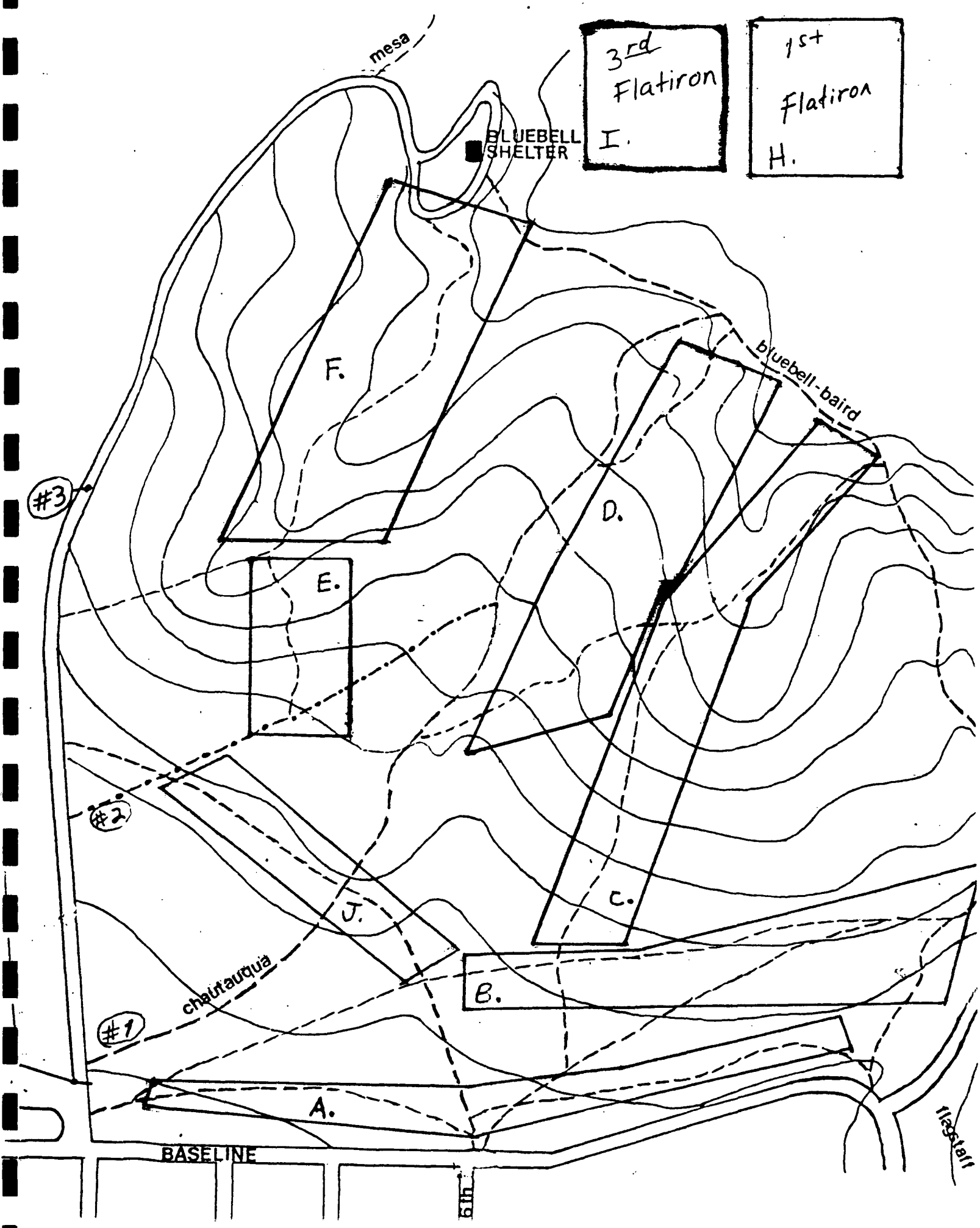
I. hiking
II. jogging
III. picknickers
IV. climbers
V. horse riders

Quadrant locations

A. Lower meadow (off baseline)
B. middle meadow " "
C. direct ascent W meadow
D. traverse from Chat. Tr. to W.
E. New Ranger Tr. '83
F. Upper meadow to Bluebell
G. Designated Trails
H. 1st Flatiron
I. 3rd Flatiron
J. Middle Meadow East

USE TYPE

I.	II.	III.	IV.	V.	Quad	Totals
84	51		4		A	139
50	80		6		B	136
41	8	4	2		C	55
76	1	3	4		D	84
86	16	5			E	107
87	7				F	94
992	111		91	1	G	1194
5			39		H	44
3			97		I	100
92	35	2			J	129


mesa
3rd Flatiron I.
1st Flatiron H.
BLUEBELL SHELTER
F.
bluebell-baird
D.
E.
#3
#2
J.
C.
chautauqua
B.
#1
A.
BASELINE
6th
flagstaff

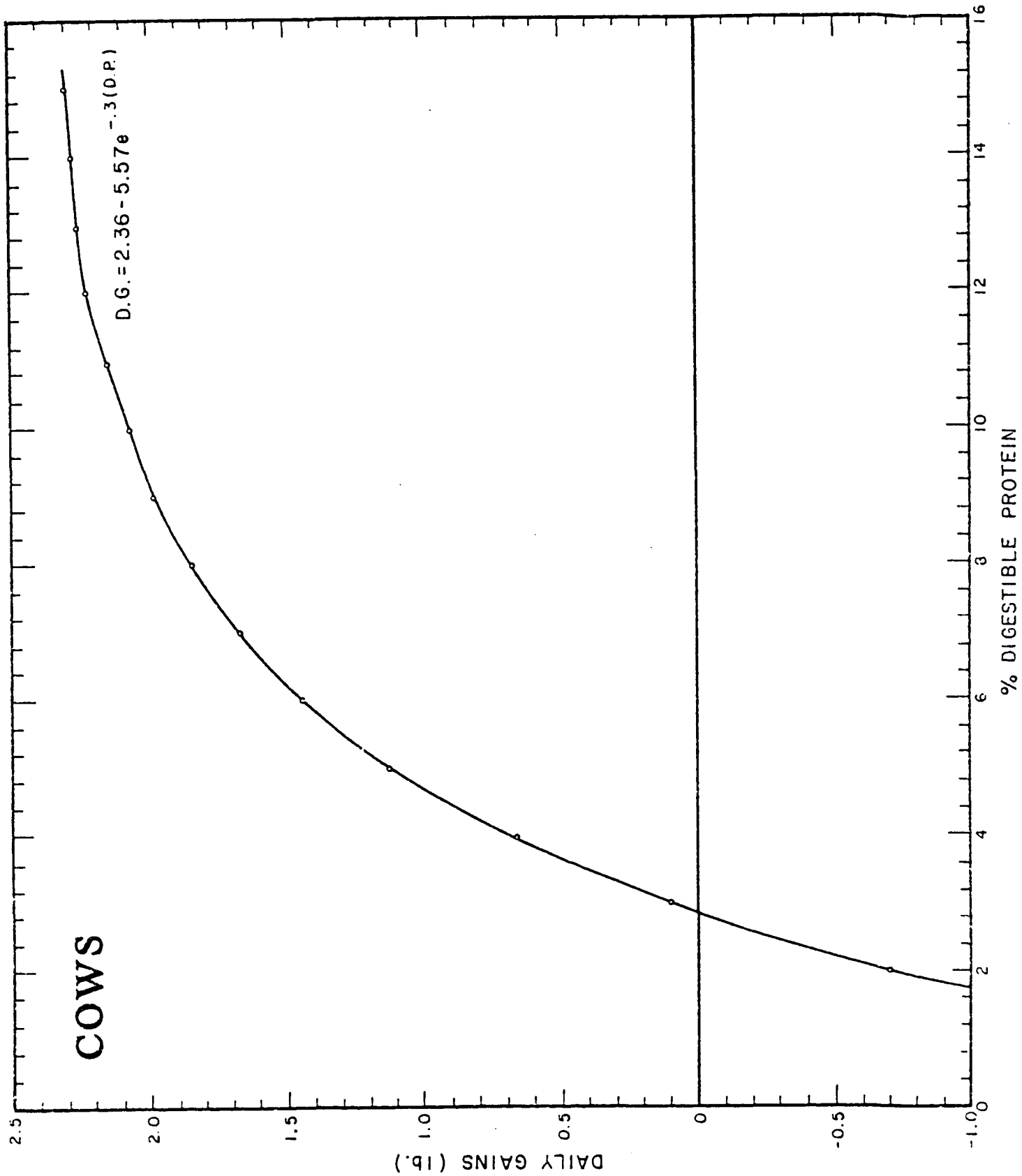


Figure 3. Predicted average daily gain for a typical range cow, during spring and summer, based on the digestible protein content of the diet (dry matter basis).

Table 22.--Continued.

SPECIES NAME Scientific	SPECIES NAME Common	Stages of Growth	Season	Total Protein (%)	Digestible Protein (%)	Metabolic Energy (kcal/lb)	Digestible Energy (kcal/lb)	P%	Carotene (mg/lb)
Agropyron smithii	Western wheatgrass	4th leaf	Spring	9.4	5.0	1068	1365	.20	---
		Boot	Spring	15.0	11.1	1080	1350	.26	60.00
		Seed	Summer	7.0	3.9	1000	1269	.16	---
		Shatter	Winter	5.4	2.6	995	1160	.10	00.10
Agropyron trichophorum	Pubescent wheatgrass	5th leaf	Spring	16.5	11.9	1159	1449	.24	---
		Early head	Spring	11.1	6.8	987	1234	.18	30.00
		Preanthesis	Spring	9.7	5.8	943	1178	.16	---
		Seed	Summer	8.3	3.8	799	1090	.11	---
		Shatter	Winter	7.2	3.2	750	978	.10	00.06
Agrostis alba	Red Top (pasture)	Vegetative	Spring	17.9	13.6	1220	1537	.21	54.30
Andropogon scoparius	Little bluestem	Vegetative	Spring	12.0	8.2	1401	2021	.26	65.40
		Head	Summer	10.0	5.9	---	1640	.21	25.10
		Seed	Summer	8.4	5.2	---	1266	.16	---
		Shatter	Winter	5.0	3.2	---	976	.11	00.08
Andropogon gerardi	Big bluestem	Vegetative	Spring	11.6	7.8	1365	1989	.24	45.00
		Head	Summer	9.0	5.4	---	1540	.22	35.00
		Seed	Summer	7.0	4.0	---	1100	.16	---
		Shatter	Winter	4.9	3.0	---	905	.11	00.10