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Trail System Deterioration in the Boulder
OSMP Studies 4073



Brown, Connelly et al

TRAIL SYSTEM DETERIORATION
IN THE
BOULDER MOUNTAIN PARKS



FALL 1992

text, maps and photography by

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I. INTRODUCTION

During the summer and fall of 1992 it was deemed necessary to update the 1983 Mountain Parks Report on social trails in the Mountain Parks system. This was due to the increased use of the Park by the public and especially due to the increased popularity of technical rock climbing. This interest in rock climbing has lead to an increase in both the development of social trails and heavy erosion in areas of the Park that have until recently been relatively little used, and a further exacerbation of these problems in areas of the Park that have always been heavily used. The addition in 1991 of two part time backcountry rangers to the Mountain Parks staff has helped to confirm this increased deterioration of the Park.

The primary objective of this study was to document all social trails in three specific heavily used areas of the Park, to record specific problems in these areas, and to offer recommendations on alleviating these problems. Social trails are defined in this report as unimproved, unofficial trails that have been developed over the years by climbers and hikers who hike off official Park trails. The three areas that were studied for this report are the Flatirons area, Dinosaur Mountain, and the Fern Canyon area. Other areas in the Mountain Parks that were not inventoried at this time were left out due to a shortage of both time and manpower, and should not be assumed to be in satisfactory condition.

The trail inventory was conducted by three University of Colorado students participating in an internship with the Boulder

Mountain Parks under the supervision of Ann Wichmann, a senior ranger at the Park.

II. PROCEDURES

“Social trails do not appear on any maps published to date. They have no signs posted along them and they are virtually unmaintained. They develop as social use increases and they occasionally fade when social use declines and natural revegetation occurs. More often than not these trails collect water or become drainage routes as the denuded and compacted soils are lower and less resistant to flow than the surrounding country. When this occurs the natural revegetation process may be hindered for decades”^{II.1} In order to document social trails a three-fold process was implemented; field analysis, mapping, and written descriptions. The Flatirons, Dinosaur Mountain, and Fern Canyon areas comprise the three zones addressed in this report.

A base map was created at a scale of one inch to four hundred feet from the Mountain Park Map published by the Boulder Group of the Colorado Mountain Club. This scale was chosen because it corresponds to the air photos that aided field interpretation.

Mapping social trails was accomplished by field observations recorded on base maps using basic mapping skills. These detailed base maps are accompanied by written comments found in the AREA REPORTS section. Boulder Climbs North written by Richard Rossiter was used to reference rock formations incorporated into AREA REPORTS. Finally, after locating and cruising social trails, corrective management procedures were recommended for high priority areas.

II.1 Ross, Steve and Miller, Scott., Trail System Deterioration Boulder Mountain Parks. Fall 1983

III. AREA REPORTS

The trail system of the Boulder Mountain Parks will be discussed here by considering three different areas. The Mountain Parks were divided into these areas based on frequency of use by the public, similarities in management problems, and natural geographic divisions. This report details field observations of social trails, specific problems, and possible management solutions for each of the three areas.

1. THE FLATIRONS

Compiled by Chris O'Riley

This area appears to have the greatest problems in the entire Park. Although changes have been made in this area based on the recommendations of the last trail inventory report in 1983, this area can be said to be in much worse overall shape due to increased use and insufficient funding for rehabilitation.

The Flatirons study area covered the area bounded on the north by the Gregory Canyon parking lot and on the south by the southern side of the Third Flatiron. The entire Flatirons study area is very popular with technical rock climbers which has led to heavy use and subsequent trail deterioration and development of an increased number of social trails. This area is geographically defined by steep terrain which has also led to erosional problems. Once the surface vegetation is trampled subsequent human use and weather related factors further erode the loose rock and soil. Roughly 10 miles of social trails were inventoried in this area including 1 1/2 miles of severely eroded trails 30 to 80 feet wide.

A. THE AMPHITHEATER

In the Amphitheater area, the most severe problem is an area of erosion beginning at the picnic table adjacent to the Gregory Canyon parking lot and traveling directly to the south (uphill) to the Amphitheater ([1] on map#1 and photo #1). This eroded trail is most probably used as a quick descent from the Amphitheater to Gregory Canyon as it is very steep with loose rocks and dirt and difficult to climb up. It is approximately 60 feet wide for most of its length and 80 to 100% denuded of ground vegetation. Trees are still in abundance, but have many exposed roots. There are also several social trails heading directly west from the Amphitheater trail directly up to the Amphitheater.

There are also a number of social trails between the Amphitheater trail and the Bluebell-Baird trail a short distance from the Gregory Canyon parking lot. Some of these social trails connect the aforementioned official trails and some lead up to the First Flatiron. Where these trails cross the Bluebell-Baird trail ([2] on map#1), there are no signposts. As both trails are the same width, this leads to a great deal of confusion on which way the Bluebell-Baird trail goes.

RECOMMENDATIONS FOR THE AMPHITHEATER AREA:

1) Close the eroded trail from the Gregory Canyon parking lot to the Amphitheater ([1] on map #1). A rail post fence should be constructed at the base of this trail near the picnic table to keep people from going up to the Amphitheater. However, since most people appear to use this trail as a descent, some sort of deterrent

Trail
 needs to be placed at the top near the Amphitheater itself. A rail post fence at this juncture seems like an extreme measure, but it may be the only way to keep people from using this trail as a descent. There should be information posted on these fence barriers stating that the reason for them being there is to stabilize and revegetate the area. All smaller social trails in the Amphitheater area should be closed with brush and slash and have information signs posted on the reasons for such closure.

2) The Bluebell-Baird trail near Gregory Canyon should be well marked with trail markers whenever a large social trail intersects it. These social trails should also be closed. *Washburn*

B. THE FIRST FLATIRON

The First Flatiron suffers major erosional areas on both the north and south sides due to frequent use. On the north side there is a wide area of erosion from the west bench at the top, down to the rocky ridges below the base ([3] on map#1). This eroded area is approximately 80 feet wide at its widest and up to 75% denuded of surface vegetation. This area seems to be more of a descent trail from the top as there are no direct trails leading to this area from the base of the First Flatiron and as there are two official trails which point people up towards the First Flatiron.

One of these official trails to the First Flatiron is called a Climbing Access trail and was built in 1990 - 91 in an area of severe erosion between the Saddle Rock trail and the top of the First Flatiron ([4] on map#1). This area is currently being revegetated by the Mountain Parks Department. Most climbers and hikers now appear to

be using this official trail rather than the adjacent eroded area. This should be used as a model in dealing with some of the other eroded areas of the Park.

Trails leading to both the First and Second Flatirons begin from the Bluebell-Baird trail a short distance south of the intersection of the Bluebell- Baird trail and the Chautauqua trail. This is also about 600 feet north of the Bluebell Shelter on the Bluebell-Baird trail ([5] on map#1). The First Flatiron trail splits off from the Second Flatiron trail and heads west between the First and Second Flatirons. This area between the First and Second Flatirons, from their base to their top, was recently developed as an official trail, but is now severely eroded with little resemblance to a well developed official trail ([6] on map#1 and photos #2 and 3). There are two separate areas of erosion with one close to the south side of the First Flatiron and one on the north side of the Second Flatiron. Both areas are almost totally denuded of ground vegetation and are at points 50 to 60 feet wide. This area appears to be the most heavily eroded area in the Flatirons ⁴⁰² and deserves immediate attention. *

There are also wide areas of erosion leading from the west bench of the First Flatiron down to the west bench of the Second Flatiron and surrounding Sunset Rock just west of the First Flatiron ([7] on map#1 and photo #4).

The area below the base of the First Flatiron to the northeast has a large network of braided trails which has the potential to expand into more severe erosion ([8] on map#1).

RECOMMENDATIONS FOR THE FIRST FLATIRON AREA:

1) The official First Flatiron trail should be developed through the area of erosion between the First and Second Flatirons and should connect with the Climbing Access trail at the west bench of the First Flatiron. This will create a loop, something many hikers like, around the First Flatiron from the Bluebell-Baird trail to the Saddle Rock trail. This trail will also give access to the top of the Second Flatiron. The remaining eroded areas should be closed and revegetated.

2) A climbing access trail should be developed in the eroded area on the north side of the First Flatiron from the west bench at the top to the break in the ridge at the bottom ([8] on map #1) and then continuing southeast until it intersects with the First Flatiron trail. All other social trails to the First Flatiron should be closed with slash or with fence posts.

C. THE SECOND FLATIRON

The Second Flatiron trail heads west from the intersection with the First Flatiron trail until it reaches the base of the Second Flatiron, where it curves around to intersect with the Third Flatiron trail. At the point of this curve there are a network of braided trails which continue towards the south side of the Second Flatiron eventually turning into a wide area of erosion that continues up to the top of the Second Flatiron ([9] on map#1).

Between the First and Second Flatiron trails there is an extensive network of braided trails and erosion which has the potential to develop into more severe erosion ([10] on map#1). These braided trails appear to be used as an ascent by people trying to get

I would suggest that at all major junctions in the Flatirons/Chautauque area we have in 11" x 14" photograph showing "you are here" + where all trails lead. May well reduce crosscutting if users clearly understand where they are + where trails go. BP from the Second Flatiron trail to the area between the first two Flatirons.

RECOMMENDATIONS FOR THE SECOND FLATIRON AREA:

1) There should be a continuation of the Second Flatiron trail to the southwest past the point where it currently bends eastward to intersect with the Third Flatiron trail. This trail should continue to the top of the Second Flatiron via the south side through the talus fields near the top. Any remaining social trails in this vicinity should be closed.

2) The area of braided trails between the First and Second Flatiron trails should be closed. A fence may be needed where many of these trails leave the Second Flatiron trail ([10] on map#1).

D. THE THIRD FLATIRON

An official trail from the Bluebell Shelter to both the east and west benches of the Third Flatiron is currently nearing completion. Hopefully this will funnel hikers away from the eroded area on the north side of the Third Flatiron ([11] on map#1 and photo #5). This eroded area is up to 100% denuded of ground vegetation and up to 50 feet wide. The new trail proceeds up a talus slope to the north of the erosion and will hopefully allow this damage to be re vegetated. In some places the Third Flatiron trail intersects with large social trails and it is difficult to know where the official trail is.

Even though there is now an official Third Flatiron trail, many hikers and climbers continue to access the Third Flatiron from the Royal Arch trail. This is due to the Royal Arch trail passing in close proximity to the base of the Third Flatiron and to the unobstructed

With balcon using the s. side we should take all steps necessary to close this Royal Arch route. A key will be to have well clear approach trails + signing to make official options obvious.

We need a Royal Arch sign saying "No access to 3rd Flatiron" 10

views of the Third Flatiron from the trail. In a 1000 foot stretch of the Royal Arch trail directly to the east of the base of the Third Flatiron, sixteen social trails were counted leaving the trail and heading to the Flatiron ([12] on map#1). These sixteen trails soon converge to 3 or 4, but the erosional damage at their point of departure at the Royal arch trail is extensive. Attempts to block these trails with brush and tree branches has been largely unsuccessful.

We need great 3rd Flatiron trails first - then it will be easier to close these.

There are several social trails on the south side of the Third Flatiron but as this area is very rocky and difficult to traverse in places, it does not seem to be as heavily used. However, what vegetated areas occur on this side are suffering from erosion and roughly a 30 to 40% loss of vegetation.

The area bounded by the Royal Arch trail and the Third Flatiron trail has an extensive network of social trails zig-zagging the relatively open hillside. Some of these trails traverse small rock talus fields causing erosion as well as dangerous footing conditions.

RECOMMENDATIONS FOR THE THIRD FLATIRON AREA:

1) All sixteen trails which spur off of the Royal Arch trail towards the Third Flatiron should be closed using a rail post fence, as slashing these trails has not been effective. Information about the reasons for the closure should be posted on this fence. *Agree*

2) The few social trails that continue from the Royal Arch trail to the rocky Ghetto area and numerous other technical climbs on the south side of the Third Flatiron should be closed due to the steep rocky terrain and the nesting of raptors in the area. However, since this is a popular climbing spot, this may not be possible.

*10 - Educational signs first
- Good alternatives second
- Through closure third*

3) Many people who access the Third Flatiron by way of the Royal Arch trail don't realize that there is an official Third Flatiron trailhead 100 feet to the west of the Royal Arch trailhead. A sign should be placed at the Royal Arch trailhead informing people of the existence of the Third Flatiron trail. *← Absolutely*

4) The Third Flatiron trail should be more clearly marked along its length so as to alleviate the confusion as to where the trail actually goes.

E. CONCLUSION FOR THE FLATIRONS AREA

A final recommendation for the entire Flatirons area would be to initiate a campaign to educate the public on why certain areas have been closed and why certain other areas are being developed with official trails. This campaign should include signs in the effected areas similar to the wildlife closure signs now in use in the Park. Informational flyers should also be placed in the trailhead information cases explaining the program. Various public talks by the rangers explaining the program should be scheduled around town. Press releases should be given to both the print media and radio stations about the closures, revegetation attempts and trail development. Finally, an "emergency no off-trail use" ordinance in designated areas should be considered. *See also*

The priority recommendations for this area should be the eroded areas between the First and Second Flatirons, the Amphitheater, and the Royal Arch trail below the Third Flatiron.

At first sight, these recommendations may appear to overemphasize development of trails at the expense of the

undeveloped feel of the park. It must be acknowledged, however, that in the areas recommended for trail development there are already areas of severe erosion due to frequent use. By funneling people onto a well built official trail, the remaining areas of erosion can be stabilized and revegetated. People will not give up using the park, nor will they give up their perceived right to access most areas of the Flatirons. However, most people will stay on official trails if they know there is one going to their destination and will stay off closed social trails if they realize that by using them they will damage the Park. Developing official trails in areas that people use anyway allows for the stabilization of adjacent eroded areas and for the continued access of the Flatirons by the public.

2. DINOSAUR MOUNTAIN

Compiled by Jay Sugnet

Introduction: Dinosaur Mountain is a relatively small area with a plethora of rock, making it an ideal area for rock climbing. However, the terrain is rather steep and prone to erosion as witnessed by the existence of a trail between almost every rock formation. Due to the steep grade of the slopes, the majority of people using the social trails are rock climbers accessing routes, with very few hikers. With the moratorium on bolting in effect, I do not anticipate any further trail formations, but the existing trails are receiving more use and experiencing greater erosion. This is especially true since wildlife closures in other areas attract climbers to Dinosaur Mountain. See area photo #6.

A. MALLORY CAVE TRAIL

Mallory Cave Trail is the only official trail penetrating Dinosaur Mountain, it handles most of the use in the area and has been greatly improved over the past five years, but a few problems remain. Two areas in the lower extent, as indicated on the map, are relatively steep and in the case of rain, muddy. This has caused people to widen the trail to avoid the mud; a few water bars are recommended. See photo #7.

The majority of people hiking on the Mallory Cave Trail expressed confusion, and many wandered from the main trail. This has caused severe braiding along the length of the rock called Der Zerkle. To avoid the braiding I strongly recommend the use of *directional* markers to indicate where the path leads. This is especially true at the base of Der Zerkle where the trail narrows and abruptly climbs up. Many hikers turn off the trail, directly where a marker exists, and head towards the east side of Dinosaur Rock. I have placed dead trees to guide hikers but they are promptly removed and confusion resumes. Stone steps exist in this area but many hikers form their own path which has destroyed approximately 80% of the vegetation at the base of Der Zerkle. The use of trail boundaries would be useful and would allow for the return of vegetation. Otherwise this trail is in excellent condition but deserves priority due to its high usage.

7. avoid high steps and too high causing wear to the ground. The hiker's path will be improved.

Climbers also contribute to erosion *off* the trail in a popular area on Der Zerkle by the climb 'The Final Solution.' This area has been 90% devegetated by as many as a dozen people waiting in line to climb the three bolted routes and a bouldering traverse. See photo

Are these new routes? and should we remove them? and other routes 13 which are causing damage?

#8. The same situation has occurred in 'The Court' on the west side of Der Zerkle where many other classic bolted climbs exist. *Some questions on map: 13*

A climbers' social trail has been formed starting at the east side of The Hand, which reaches over fifteen bolted routes on the south side of The Hand, The Dwarf, Frankenstein's Castle and Der Freischutz. This trail is rather steep, but needs only minor improvements. No signs are recommended since it is a well known area to climbers with some classic routes and any more signs would only encourage further use. I would recommend improving the trail by making its upper extents more distinguishable between Frankenstein's Castle and the south side of The Hand.

B. BEAR CANYON:

The Bear Canyon Trail is an official trail with numerous social trails running parallel to it along the creek. The main social trail runs from the fire access road by the Bear Creek Pool, along the north side of the creek, and all the way to the South Ridge. This trail is stable and is also a shortcut which would make it impossible to close. The trail on the south side of Bear Creek is not very stable but was not a part of this study. Fortunately the main social trail is well hidden and used only by a few people, mostly climbers. Unfortunately, it has a major impact on riparian vegetation and a study concentrating on hiker impacts on Riparian communities in both Bear Canyon and Skunk Canyon is recommended.

*Nothing
can be done
better: app-
rock route*

From the main social trail several trails diverge. The first trail from the east is on the west side of Bear Creek Spire. This area shows extensive erosion of a slope devoid of vegetation and covered with

scree. A sign at the base indicating 'closed for revegetation' is recommended since it is also a dangerous area to hike. The trail continues up to two climbs on a small hogback called Hueco Wall. This area has some of the worst erosion I witnessed on Dinosaur Mountain, and is directly attributable to climber activity. See photo #9. Many roots of trees have been exposed and their survival has been threatened. See photo #10. I don't normally advocate the removal of routes, but this area is an exception. The only alternative would be to place a trail leading from the west side of Bear Creek Spire, the condition of which has been described above, to Hueco Wall.

I would like to see how we have to maintain the trail. The park is the no-tolerance in the present.

In the area between Southern Dinosaur Egg and Stonehenge there are several braided trails accessing climbs on The Bubble and the two aforementioned rocks. One trail should be made distinguishable and improved while closing the others. An advisory sign is recommended for this area to reduce trailblazing. The trail on the west side of Stonehenge should also be improved up 150 feet to the climb 'The Fiend,' 5.13b.

At some point (soon!) we must decide if we are going to let climbers go anywhere everywhere (Address in Zone Mt)



An extremely steep and fragile ravine above The Bubble has been an access trail to the climbs on the northwest corner of Der Freischutz. This trail is used by climbers to access both the climbs in Bear Canyon and the Mallory Cave area in the same day. This trail should be improved with water bars and steps to save the remaining vegetation. Closing is not an option since an alternative route would be unthinkable to most climbers. It has 80% vegetation and limited traffic, therefore I recommend minor improvements until further observations warrant action.

Sounds like a candidate for closure to me

The final social trail starting from the creek is on the back side of Dinosaur Mountain, west of the South Ridge. Two trails exist with the same objective only ten feet apart. This area is unstable and in need of consolidation to access some very popular climbs i.e. Megasaurus.

C. NORTHERN DINOSAUR and THE PORCHES:

This area is seldom used by hikers and contains no official trails. A social trail has formed leading up the eastern slope of Dinosaur Mountain where the N.C.A.R. trail meets the Mesa Trail. This trail is steep, unstable, and leaves a highly visible scar. I strongly recommend the closure of this trail with a sign indicating "CLOSED FOR REVEGETATION-climbing access to the Porches 100 yards north." Another trail 100 yards north of the trailhead sign on the Mesa Trail is more stable, less visible and reaches the same objective as seen on the map. The trail itself should be left unmarked so as to not encourage increased use. The remainder of the trail, from where the two trails described above intersect to the base of the Front Porch is relatively stable and not *currently* in need of any improvement.

We need to completely close this area - the canyon zone west of Mesa Trail NOW! before further damage occurs. Can we provide alternative access higher on ridges?

D. SKUNK CANYON:

The south side of Skunk Canyon is the most pristine area on Dinosaur Mountain, but is unlikely to remain in that condition. The trail is rather narrow along the canyon and dwindles out beyond the North Ridge. There are also several smaller social trails accessing the climbs on The Dreadnaught and The Achean Pronouncement. These are barely discernible and are not causing any severe erosion, but with

increased use the potential remains. The area north of the creek in 'the ridges,' Ridges 1,2,3,4 etc., does have numerous trails in need of stabilization which access climbs, but due to time and resource constraints it was not a part of this study.

E. RECOMMENDATIONS:

Recommendations for the Dinosaur area include the following:

- 1) Close the trail at the Mesa and N.C.R.R. intersection and direct traffic to the trail 100 yards north of the Trailhead sign on the Mesa Trail as described above.
- 2) Place water bars on the lower extent of The Mallory Cave Trail.
- 3) Close the area to the west of Bear Creek Spire and remove the routes on Hueco Wall.
- 4) Place advisory signs in all trailhead information stations, at the entrance to Skunk Canyon, and at the starting point of Mallory Cave Trail.
- 5) Improve the trail from the Bubble up to the Mallory Cave Trail.
- 6) Close Skunk Canyon! *YES!*
- 7) Stress education of hikers and climbers as to the problems of erosion and trail deterioration. *habitat fragmentation, more -*
men's corridors, biodiversity

3. FERN CANYON

Compiled by Connelly Brown

Introduction:

This area has been divided up into subsections. These subsections correlate to various climbing routes, hence, dominant rock formations were used as a point of reference. A booming climbing population puts more pressure on social trail access. One pattern worthy of mentioning deals with immediate access from marked trails. Braiding develops within the first fifty feet off the established trails, but diminishes as trails approach rock wall bases. The problem stems from no climbing access signs which creates braiding from different access points that eventually lead into one trail. Furthermore, trails crossing talus fields of car sized boulders pose no significant threat because climbers proceed over the boulders instead of more sensitive vegetated areas. Basically, it boils down to immediate access from established trails and rock wall base trails creating the greatest erosion problems.

A. Bear Creek:

Braided trails climb due south of Bear Creek trail and end up crossing talus slopes. The three trails that lead to one trail adjacent to the west side of Overhang rock demand attention. More braiding exists accessing Poot Ridge and Sanctuary. One trail follows the west side of Poot Ridge and dissipates into a talus slope. Two branches lead into one fairly established trail that runs along the west flank of the Sanctuary.

Recommendations: Mark one access braid and close off other braids.

*This is mentioned in many guides
should it be a designated trail?*

B. Seal Rock/Harmon Cave:

Harmon Cave social trail runs west from the fire road right after Bear Canyon turn off. This trail has two braids in the first twenty feet from the fire road and follows a heavily wooded gulch. From Harmon Cave the trail climbs south up a thirty five degree slope to the base of Seal Rock. A social trail runs adjacent to the south side of Seal Rock.

Recommendations: Stabilize main trail from fire road to cave with water bars and/or steps. Need to address braiding occurring around backside of cave that returns to mouth (60% vegetation, 30% trails, 10% rock). Mark switch backs up thirty five degree slope which currently displays 80% dirt, 10% trees, and 10% rocks. Forest floor is stable by composition, but needs set of marked switch-backs to eliminate random switch-backing. However, once at Seal Rock, trail running along south base is low priority.

C. Fern Canyon

Are not many of our problems here caused by new bolted routes? data goes up in pull them in '94-95. Bolting is illegal - not a right.

Due to the extensive social trail networking throughout the canyon, areas of analysis are referenced by common rock formations. Once again, the greatest problem lies within the proximity of the main marked trail where various access braids lead into one trail.

C1. Goose Eggs

Right off Fern Canyon trail north of Lookout Rock a 45 degree slope braiding of social trails adjacent to larger rock formation displays, 65% loose rock, 25% dirt, and 10% vegetation. 25 feet west around the corner from Lookout Rock another braid leads to the same route. This social trail branches off north up into the Eggs and disappears amongst the boulders.

Recommendation: Stabilize the above mentioned steep section with water bars and eliminate other braids. This access sees a lot of action due to its location at the beginning of the canyon and closeness to Fern Canyon trail.

C2. Goose

Three braids lead into two trails up the drainage southwest of the Goose and northeast of East Ridge. One trail runs adjacent to the Goose and the other over a boulder size talus slope.

Recommendations: Eliminate two braids and mark the third. The chosen braid that runs northwest from Super Fresh Block will need stabilization until it encounters the boulder field.

C3. Northeast of Nebel Horn Ridge

One trail runs adjacent to the southwest side of the East Ridge. Another trail runs along northeast side of Nebel Horn Ridge displaying severe erosion on a thirty degree slope. Two braids, 600 feet from Fern Canyon saddle, access these trails north from Fern Canyon Trail.

Recommendations: Block off braids south of the East Ridge and stabilize the braid south of Nebel Horn Ridge. Close off the trail northeast of Nebel Horn Ridge because it does not access any routes and mark the trail running along the southwest side of East Ridge

C4. Southwest of Nebel Horn

Once again, access by two braids, 400 feet from Fern Canyon saddle, leads to one trail through the boulder field southwest of Nebel Horn. On top of the saddle, access to the west side of Nebel Horn crosses 70% sandy gravel, 20% rock, 10% vegetation of original ground cover.

Recommendations: Stabilize one braid, 200 feet from Fern Canyon saddle, for access to southwest of Nebel Horn. Close off trail on saddle to north side of Nebel Horn to maintain wildlife protection.

we have to work with g.e. here since there is a direct approach trail thru summit. run west from Harmon. Tunnel. Tremendous use into the area consists largely of "wandering" hikers who don't know where they are going.

D. The Slab

One distinct path, 500 feet from Lookout rock, extending thirty feet from Fern Canyon Trail leads into two paths that ultimately end up adjacent to the northwest side of Slab. The trail running along the Slab displays, 70% loose plate like talus, 20% dirt, and 10% vegetation compared to original ground cover composed of 50% detritus, 40% vegetation and 10% rock.

Recommendations: Mark path and block off alternative routes approaching the Slab. Stabilize adjacent trail that runs along side the western base of the Slab using available talus plates to build steps.

Total Feet of Social Trails in Nebel Horn Region: 5920'

SUMMARIZED PRIORITY RECOMMENDATIONS:

In all areas, braiding adjacent to established trails needs attention. A possible solution would to determine best braid route and mark it with climbing access sign, stabilize if necessary and block off other alternate braids. In terms of actual trail construction, the Harmon Cave trail is first priority. Probably the most effective strategy that requires light maintenance is eliminating needless braids. However, as braids are eliminated and marked social trails are

established the power of the foot will bring intensive maintenance to new trails.

- 1. Harmon Cave, stabilize social trail with water-bars and or steps.**
- 2. Consolidate braids to one marked access in Bear and Fern Canyons.**
- 3. Stabilize high erosion areas:**
 - South of Goose Eggs**
 - Adjacent to East Ridge**
 - West of Slab**

 - Saddle West of Nebel Horn.**

IV. SUMMARY AND COMMENT

During the fall of 1992 this effort of documenting the trail conditions in The Flatirons, Dinosaur Mountain, and Fern Canyon was completed. We have emphasized vegetation destruction by hikers and hiker confusion as to the proper access to their objective. The problems have magnified several fold since the previous report in 1983 due to the increased usage. It has been estimated that in the past the Boulder Mountain Parks received more visitors each year than Yellowstone National Park in Wyoming, and at a fraction of its size. Many of the trails in the park are used more than a great number of the sidewalks in the city of Boulder.

This is evident in the current condition of the trails. Over the years many of these trails have widened anywhere from 100-400%. New social trails emerge as people attempt to avoid areas often crowded with people. Again, these problems exist throughout the park and are not limited to the small area encompassed within this study. To understand the true scope of the problem one only has to venture to the more obscure area of the park where vegetation is lush with an average annual rainfall of only 14 inches a year. Due to the limited rainfall, the return of vegetation is extremely slow and any further delay in combating the problems will result in escalating impacts.

We recommend that an information leaflet be placed at each trailhead sign post educating climbers and hikers to this effect:

ATTENTION CLIMBERS AND HIKERS:

YOU ARE ENTERING AN EXTREMELY FRAGILE AREA PRONE TO IRREPARABLE EROSION. WE WOULD APPRECIATE YOUR COOPERATION BY REMAINING ON THE DESIGNATED TRAILS WITH TRAIL MARKERS. THANK YOU FOR YOUR COOPERATION IN HELPING TO PRESERVE OUR MOUNTAIN PARKS!

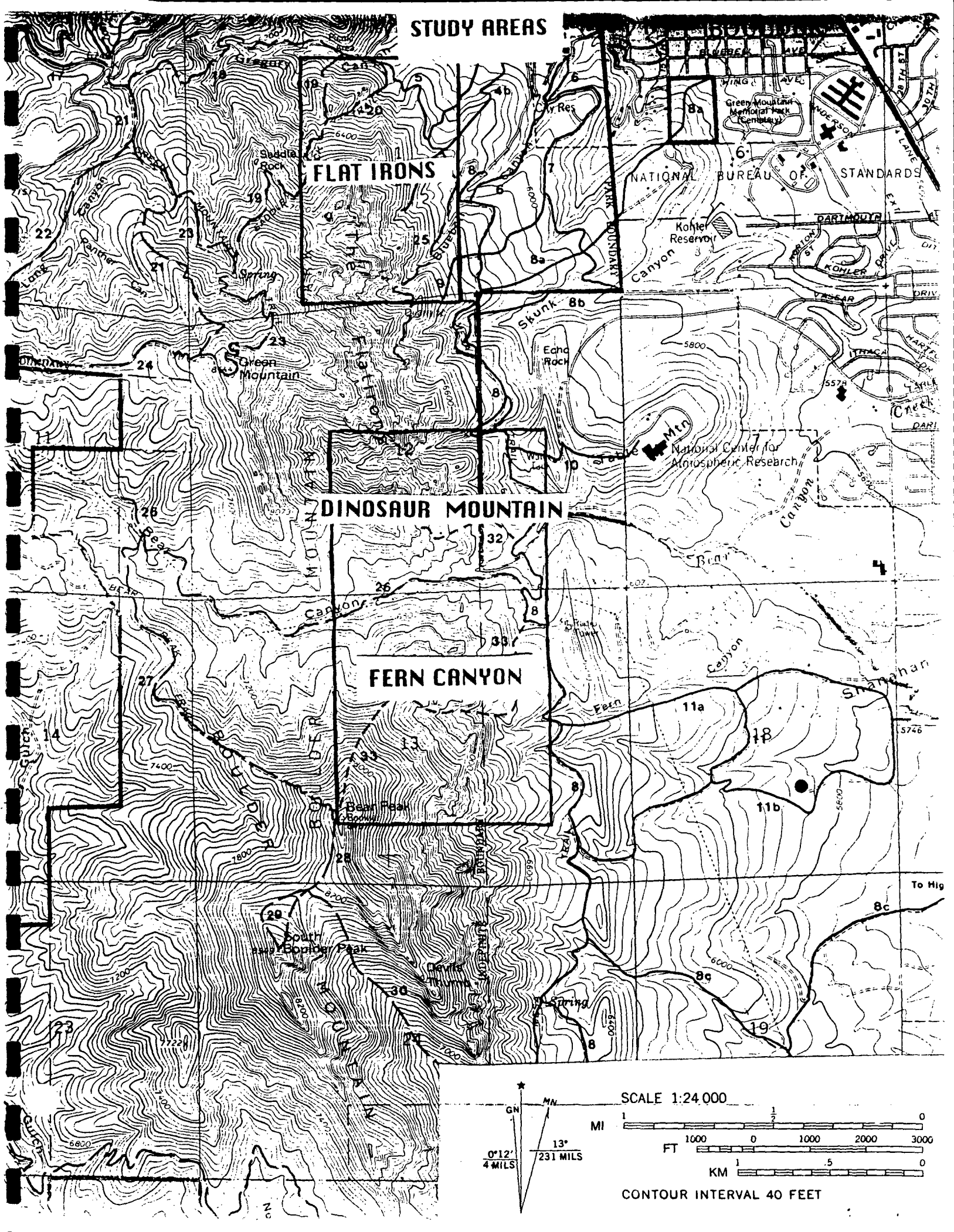
Handwritten note:
The area is extremely fragile and erosion is a major problem. Please stay on the designated trails and do not use the markers for recreation.

APPENDIX A

MAP COVERAGE

- 1) THE FLATIRONS**
- 2) DINOSAUR MOUNTAIN**
- 3) FERN CANYON**

STUDY AREAS

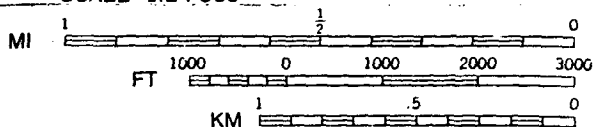


FLAT IRONS

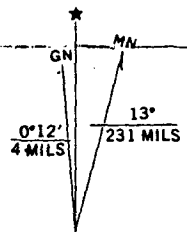
DINOSAUR MOUNTAIN

FERN CANYON

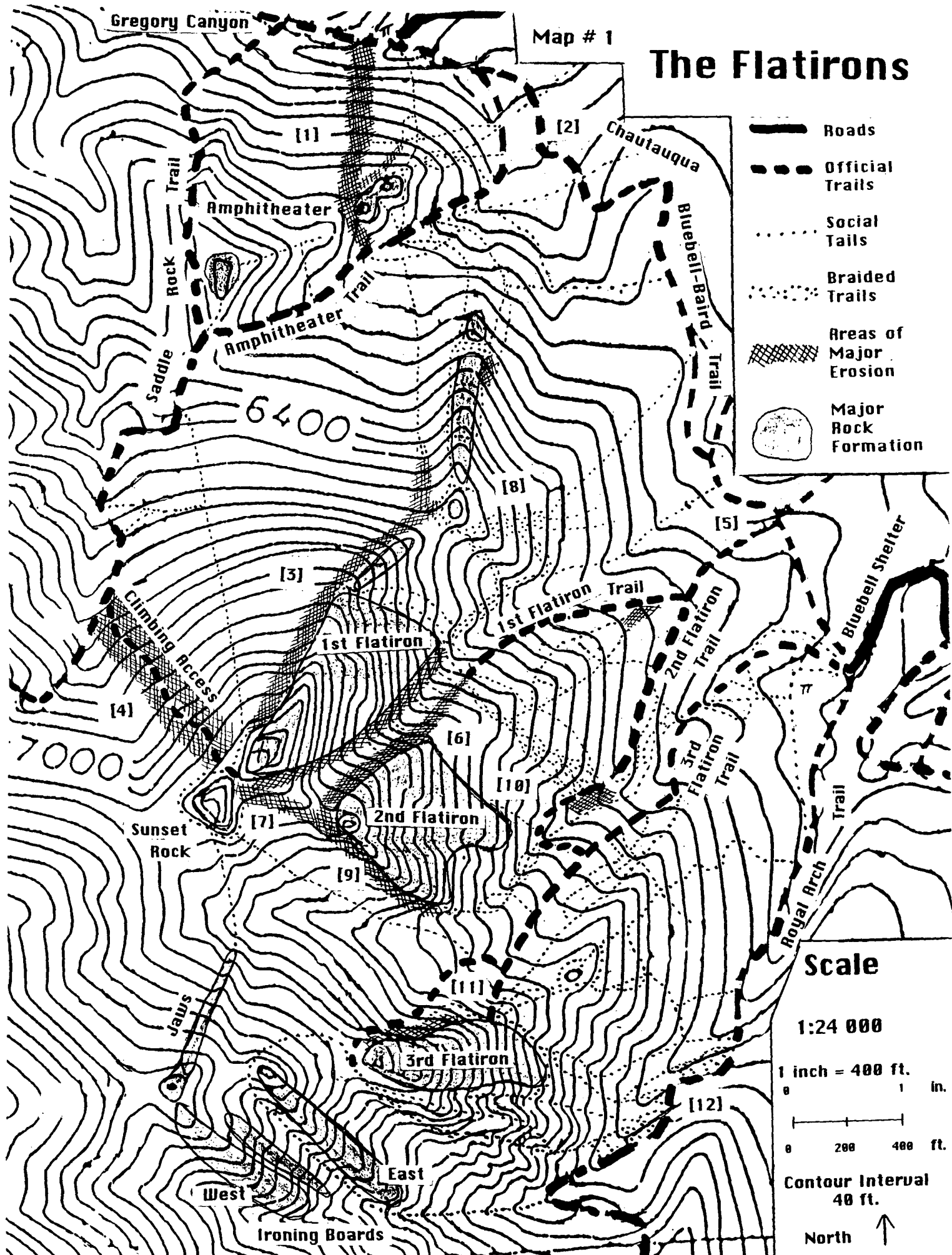
SCALE 1:24 000



CONTOUR INTERVAL 40 FEET



The Flatirons

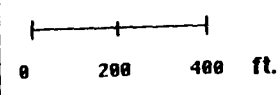


- Roads
- Official Trails
- Social Trails
- Braided Trails
- Areas of Major Erosion
- Major Rock Formation

Scale

1:24 000

1 inch = 400 ft.



Contour Interval 40 ft.

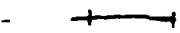
North ↑

Scale

1:24 000

1 inch = 400 ft.

1 inches



Contour Interval

40 ft.

DINOSAUR MOUNTAIN

- Roads
- Official Trails
- Social Trails
- Braided Trails
- Areas of Major Erosion
- Major Rock Formation

North



Water Tank

MESA TRAIL

FIRE ACCESS ROAD

20

32

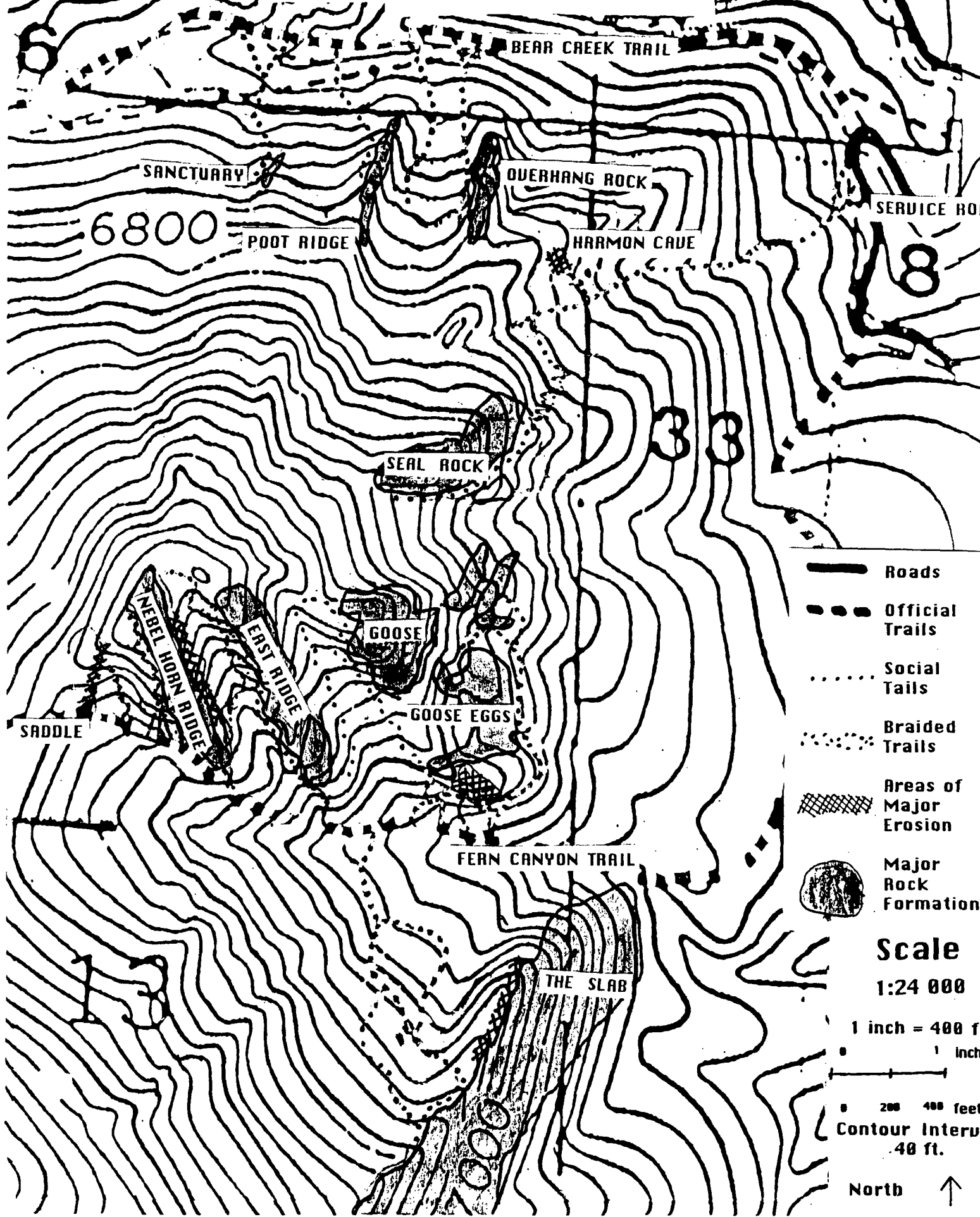
8

6600

6200

- | | | | |
|------------------------|-------------------|-------------------|---------------|
| 1-ACHEAN PRONOUNCEMENT | 5-DER FREISCHUTZ | 9-N. DINOSAUR EGG | 13-FUM |
| 2-BACK PORCH | 6-RED DEVIL | 10-FEE | 14-STONEHENGE |
| 3-THE FINGER | 7-THE BOX | 11-FI | |
| 4-DER ZERKLE | 8-S. DINOSAUR EGG | 12-FO | |

MAP #3 FERN CANYON

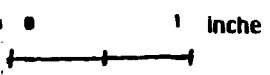


- Roads
- Official Trails
- Social Trails
- Braided Trails
- Areas of Major Erosion
- Major Rock Formation

Scale

1:24 000

1 inch = 400 ft.



200 400 feet
Contour Interval
40 ft.

North ↑

APPENDIX B

PHOTOGRAPHY

- 1) THE FLATIRONS**
- 2) DINOSAUR MOUNTAIN**



PHOTO #1: Erosion between Gregory Canyon and the Amphitheater, looking south.



PHOTO #2: Wide area of erosion between the First and Second Flatirons, looking east.



PHOTO #3: Erosion between the First and Second Flatirons, looking west.



PHOTO #4: Northwest side of Sunset Rock near the First Flatiron.



PHOTO #5: Eroded area on the north side of the Third Flatiron, near the top, looking west.

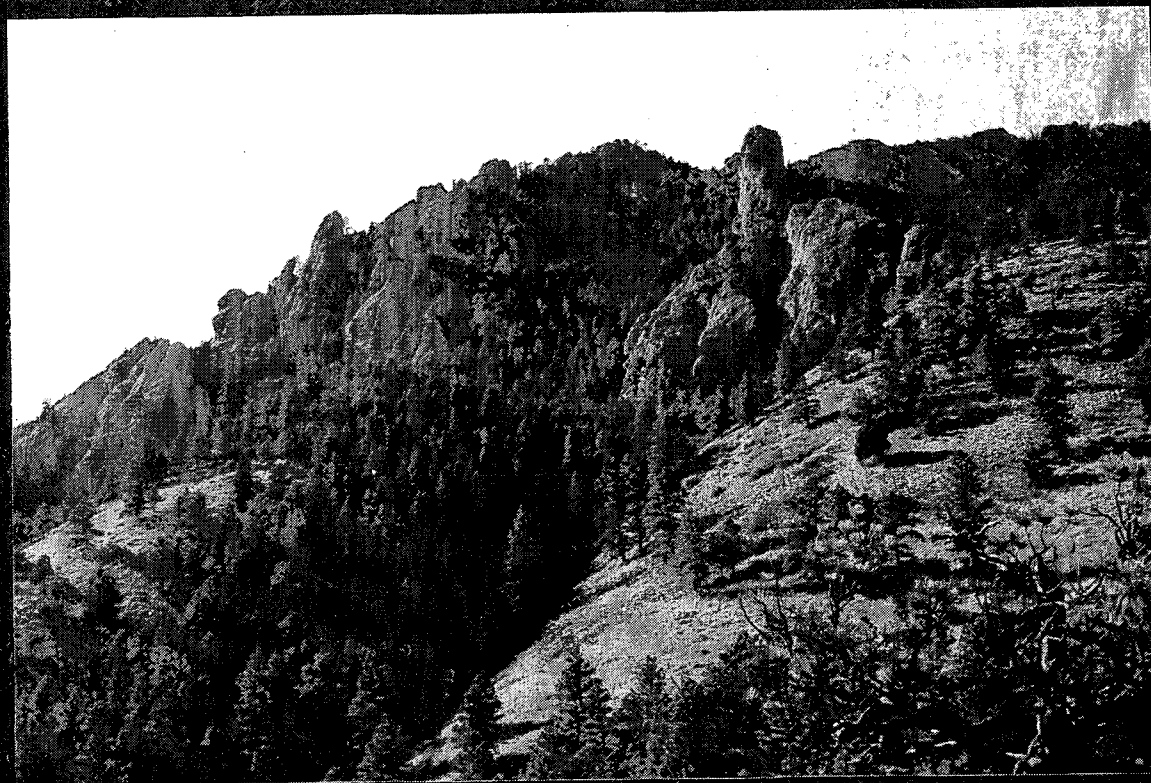


PHOTO # 6: Overview of Dinosaur Mountain.

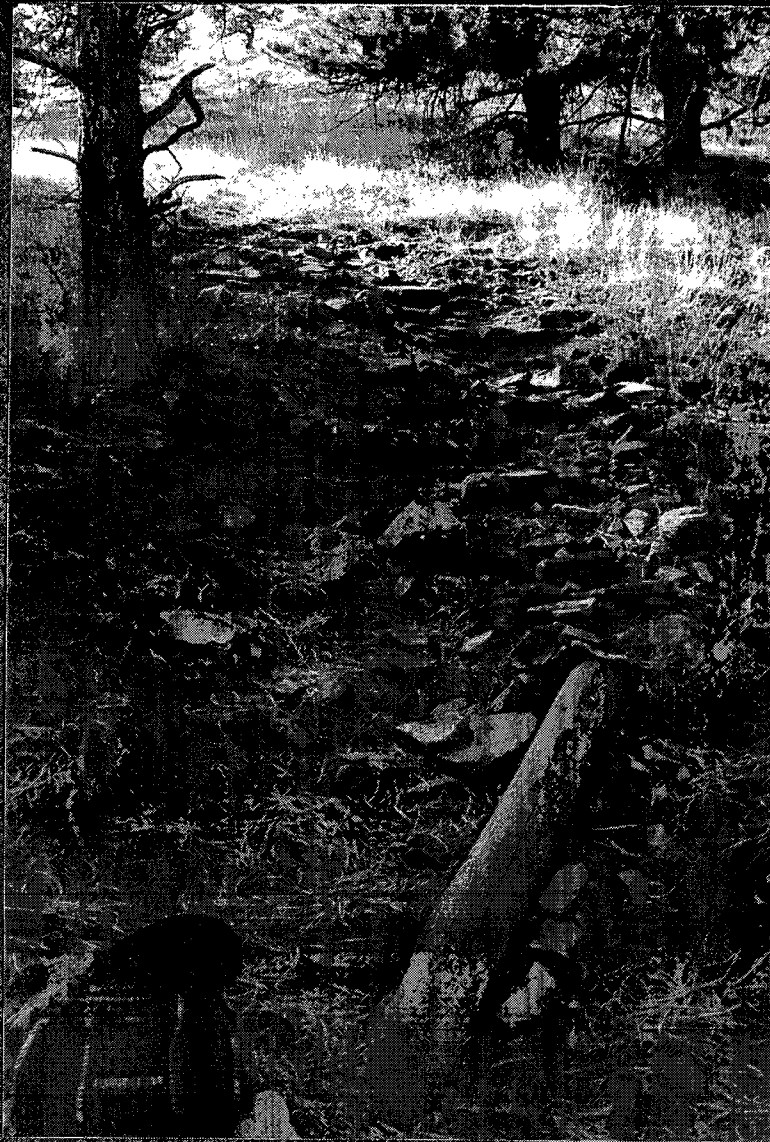


PHOTO #7: Trail migration on the Mallory Cave Trail.

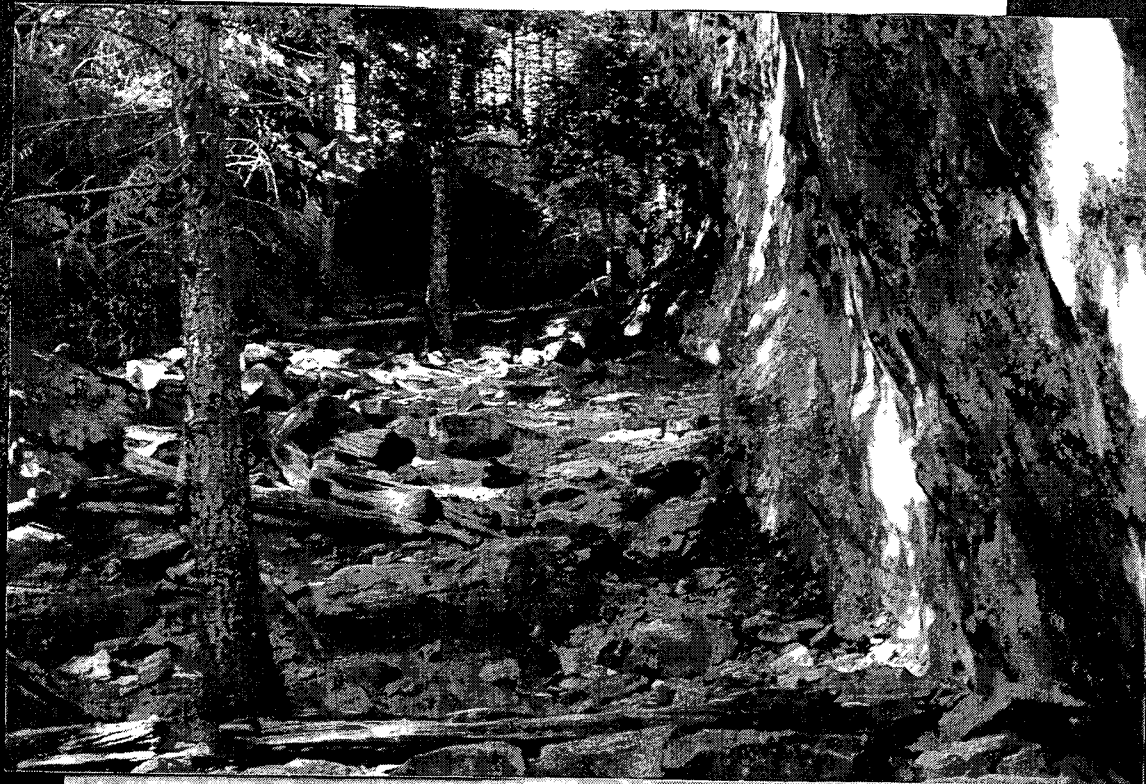


PHOTO #8: Climbing area with 'The Final Solution' to the right.



PHOTO #9: Hueco Wall area.



PHOTO #10: Exposed roots of a tree under Hueco Wall



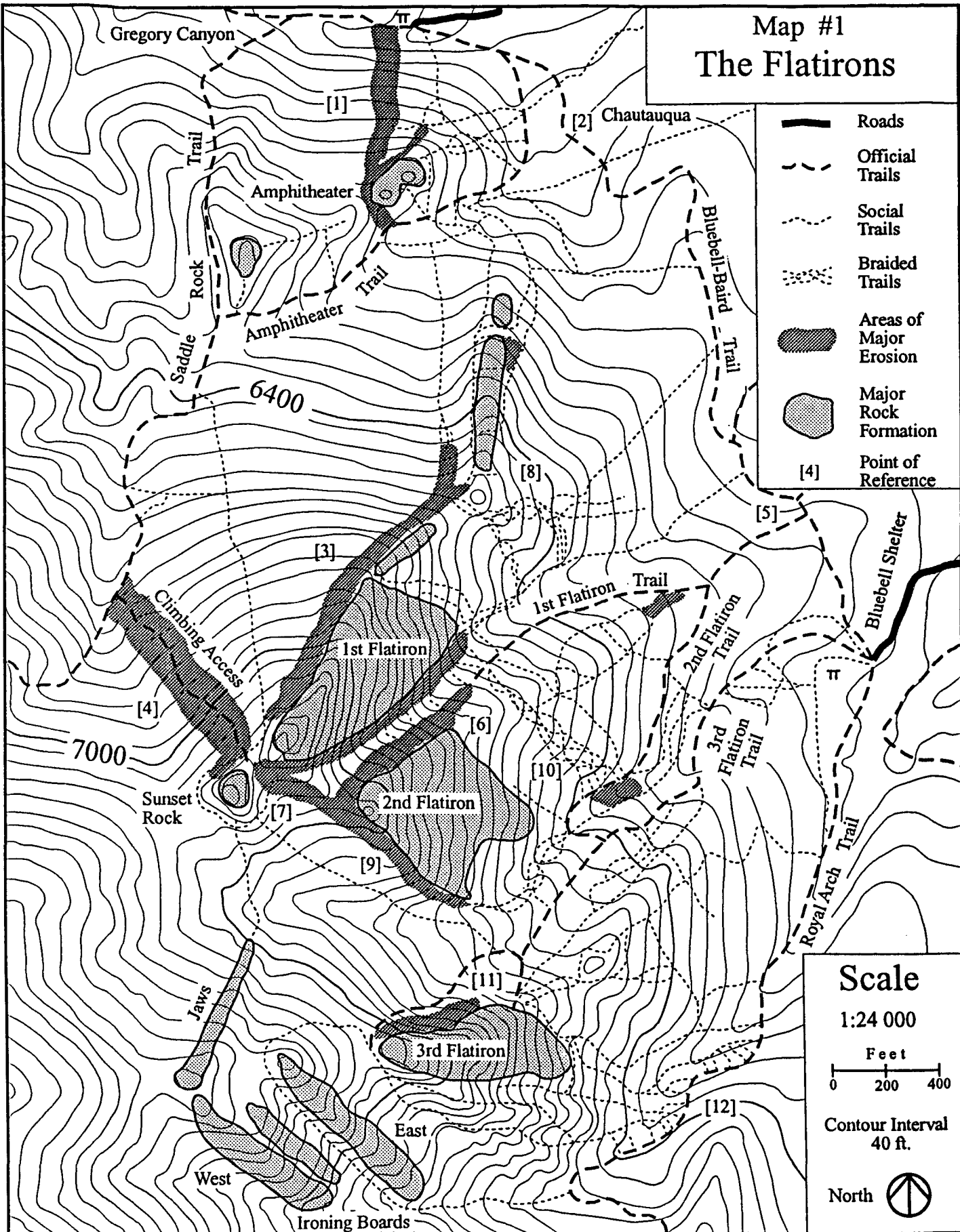
PHOTO # 11: Eroded social trail directly west of the juncture of the First and Second Flatiron trails, looking east.








Slides of social trails and eroded areas in the Flatirons study area; photographed August and September, 1992 by Chris O'Riley.

- 01) Bluebell-Baird trail - closed First Flatiron approach.**
- 02) Same as above.**
- 03) Juncture of First and Second Flatiron trails, looking east.**
- 04) Eroded trail directly west of the juncture of the First and Second Flatiron trails, looking west.**
- 05) Same as above, looking east towards the First Flatiron trail.**
- 06) First Flatiron trail just after Climbing Access spur at base of First Flatiron.**
- 07) *******
- 08) First Flatiron trail, looking south.**
- 09) Same as above, looking west.**
- 10) Eroded area between the First and Second Flatirons, looking west.**
- 11) Same as above, looking east.**
- 12) Same trail further west, looking west.**
- 13) Same as above, looking east.**
- 14) Same as above, further west, looking east.**
- 15) South side of First Flatiron, looking south.**
- 16) Same as above.**
- 17) Looking northwest from backside of First Flatiron.**
- 18) Northwest side of Sunset Rock.**
- 19) South of Sunset Rock, on trail looking south towards Jaws.**
- 20) North side of Third Flatiron near the top, looking east towards old descent.**
- 21) Eroded area between the First and Second Flatirons, looking southeast.**
- 22) Same as above, looking east.**
- 23) Between Gregory Canyon and the Amphitheater, looking south.**
- 24) West of East Bench of the Third Flatiron, looking west.**
- 25) Same as above, looking east.**
- 26) Looking north from the Ramp access of Third Flatiron.**
- 27) Near top of Third Flatiron, looking west.**

- 28) Close up of rock near top of Third Flatiron.
- 29) Same as above, with folder for scale.
- 30) Near top of Third Flatiron, looking northeast.
- 31) Eroded area between Gregory Canyon and the Amphitheater, looking south.
- 32) Same as above, further south, looking north.
- 33) Same spot as above, looking east at eroded hillside.
- 34) Looking north to south slope of lower Flagstaff Mountain, showing social trails heading north out of Gregory Canyon.
- 35) North side of First Flatiron, looking northeast.

Map #1 The Flatirons



-  Roads
-  Official Trails
-  Social Trails
-  Braided Trails
-  Areas of Major Erosion
-  Major Rock Formation
-  [4] Point of Reference

Scale
1:24 000

Feet
0 200 400

Contour Interval
40 ft.

North 