

A COMPARATIVE PHOTOGRAPHIC STUDY FOR MONITORING
AND THE ANALYSIS OF RESOURCE CHANGE
AT CRATERS OF THE MOON NATIONAL MONUMENT

CONDUCTED BY

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INTRODUCTION

Areas administered by the National Park Service are set aside to preserve and protect valued resources in perpetuity. These areas have often been assumed to be protected from forces which are changing our environment. In fact they are not. We are only now recognizing that substantial changes have occurred in many parks during past decades. Understanding the process of environmental change in parks is more important than ever. Environmental changes are now occurring in national parks at a faster rate than ever before as parks are subjected to greater visitor use pressures, increasing intrusions of pollutants and other influences from the adjacent regions, and the consequences from changing land uses in areas surrounding them. They are also being subjected to changes in global processes which are of unprecedented rapidity and which have unknown consequences. All of these factors are bringing about a heightened interest in actions which can monitor and track the condition park resources.

There are many approaches parks can and are taking to design and implement inventory and monitoring programs. These approaches vary in complexity and detail depending on the objectives of the program and the type of resources involved. At Craters of the Moon National Monument (CRMO) existing monitoring programs include daily measures of air quality, annual censuses of mule deer numbers and herd composition, calculations of annual indices of bird species richness in the different vegetation types, and bi-yearly measures of plant composition and frequency

along established transects. Most monitoring programs require and greater or lesser degree of technical training, sometimes the ability to run complex instruments, and many place great demands on the time of resource management personnel. These obstacles have in the past limited the widespread development of monitoring programs in parks and have resulted in the termination of on-going programs when personnel transfers take place. The ideal monitoring program would avoid many of these problems by producing reliable and replicable results with minimum technical training and time requirements.

This report attempts to present such a program from CRMO. It is intended to be a supplement to the monument's existing monitoring programs. The primary objective of the report is to provide a non-technical guide on the use of comparative photographs in a long-term program to monitor changes in vegetation and landscape patterns. A secondary objective is to present, in pictures, a historical perspective of the resource changes which have occurred on the monument since its establishment. These changes provide a good indication of the factors which should be emphasized in subsequent analyses of vegetation and landscape change.

A historical perspective of environmental change in parks is often lacking. This is despite the fact that most parks have a long history of research because of their unique biological, physical, and cultural resources and the availability of large expanses of undisturbed environments. This lack of a historical perspective is because in most cases, research in parks has responded only to short-term needs, i.e., immediate management

problems. Conversely, research with an extended time perspective which does not fulfill an immediate management need has often not been considered essential. There is now a greater recognition by management of the fact that park ecosystems are changing and that this change must be documented. The comparative historic and contemporary pictures contained in this report are intended to invoke an appreciation and greater understanding of the fact that environments are not static - but dynamic entities, that change occurs and must be reckoned with.

THE USE OF MATCHED PHOTOS TO EVALUATE ENVIRONMENTAL CHANGE

This publication contains 89 black and white 8x10 prints of scenes from CRMO. The actual photos are contained in two three volumes sets, one filed at CRMO and the other at the University of Idaho CPSU. There are 78 are sets of comparative photos, one old and one contemporary. Matched pairs of historical and contemporary photographs can provide a clear "picture" of the changes that have occurred at a particular site over the intervening time period. They have proven particularly useful for evaluating changes in vegetation structure and species composition which have occurred on a given site.

The methods for matching old photographs are not technically difficult. With the old photograph in hand, a search for the exact location of the picture is made through a trial and error process until the scene best matches the original. This can be very time consuming when, as was the case with many old photographs only a general location, if any, is provided with the

original. It can also be a very satisfying process, particularly when an original scene suddenly emerges after hours of searching. The search process is usually complicated when there are no identifiable foreground objects in the old picture. Framing a duplicate is also made more difficult by the fact that in most instances the camera type and the length of the lens used in the original is not known. The time of year and time of day and also effect the ability to accurately match the original photo. Complications in interpretation can arise from different patterns of shadows when the time of day of the original is unknown. In these photo retakes, we had no knowledge of the time of day of any of the originals, and even lacked specific knowledge on the day, month and year of some of the originals. Time time of day was therefore not considered. In most cases, the month of the original was matched when it was known.

PHOTOGRAPHS USED IN THIS STUDY

The original photographs retaken in this study came from a variety of sources. The ten oldest photos were taken by explorer Robert Limbert during a 1923 exploration of Craters of the Moon in 1923. Some of these photographs were used in a 1924 National Geographic article describing the wonders of Craters of the Moon and others were used in exhibits designed to encourage the U. S. government to set aside the area as a national park. Many of the photographs from the original exploration were never seen and the original negatives were apparently "lost" for many years. About 75 nitrate-based photographic negatives taken by Limbert during

the 1923 exploration were discovered in 1982 by historian Michael Ostrogorsky. The negatives were stored in the Boise Idaho attic of an elderly relative of Limbert. Ostrogorsky who was working on a historic overview of Craters of the Moon for the University of Idaho CPSU arranged for the negatives to be turned over to the park, and they were eventually cataloged and preserved by the Idaho Historical Society. Another set of old photos (13) came from the pictures taken during the study of J. S. Scofield in 1935 who developed the plans for the road system south from the loop road and into the now classified wilderness area. Eleven photos were used from the biological investigations undertaken by Coleman Newman in 1957. Additional original photos that are included in this volume were obtained from the files and archives of Craters of the Moon National Monument, the Idaho State Historical Society Library in Boise, and several local museums and county libraries.

All photo-retakes were done by the authors during the spring and summer of 1988-1990. All pictures were taken with a Nikon 35mm camera with a 50mm lens using a high-contrast black and white print film (ASA 200). The location of each camera station is shown on the enclosed map and they are contained in the park's GIS. A list of the information available on all photographs is given in Appendix I.

EVALUATION OF VEGETATION CHANGE

Several previous studies have described and or postulated changes in the vegetation of the Snake River Plain of southern

Idaho and the Bonneville Basin of north central Utah based on comparative photography. These and other studies have revealed a similar sequence of events. They have assumed that prior to settlement by Europeans the vegetation in the region consisted largely of mixed stands of sagebrush and grass maintained by occasional fire. European settlement in the mid 1800s brought about heavy grazing by domestic animals, and a reduction of juniper woodlands which were used for fuel and timber. By the late 1800s the reduction in native grasses due to over-grazing and possible alterations of the water balance (i.e., greater runoff and less infiltration) caused a reduction in fine fuels and therefore reduced fire frequencies. This in turn resulted in a rather steady increase in the densities of trees and shrubs that has continued on some sites to the present time.

On other sites where competition from native grasses has been reduced there has been a dramatic long-term increase in the densities of annual grasses. These non-native grasses such as cheat grass, cure early in the hot summer season and burn easily causing a further reduction of shrubs, trees, and native grasses. This promotes a positive feed-back cycle of increased site deterioration and more opportunities for invasion by exotic weeds and grasses. As a result of this process, in many of the drier low-land areas of the Snake River Plain the perennial native grasses and sagebrush species have been practically eliminated, and the sites are almost completely dominated by exotic annual grasses.

Craters of the Moon is unique among most sites on the Snake River Plain in that it has been free of most of the above

disturbances. The area within the Monument was never settled and probably received little historic livestock use. Since its establishment in 1924 it has not been grazed. Likewise although the monument has had a fire suppression policy in effect over most of its history, wide spread fires have not been common. Since the plant communities at CRMO have been free of the disturbances common elsewhere in the region, they offer the unique opportunity to examine changes that are the result of ecological factors.

Craters of the Moon however has not been totally immune from change. Several of the photographs depict the changes brought about by the increase in roads and physical development necessary to accommodate growing numbers of visitors to the area. This has not, however, been a one-directional shift. Visitor use in terms of motor vehicle access is more controlled today than in the past. Some of the plates show that areas which were formerly intensively used have been restored to native conditions. In addition, all mechanized use is now prohibited in the large portion of the Monument classified as wilderness.

Other changes have been brought about by NPS resource management activities. The most significant of these was the mistletoe control program of 1961-1963. At that time an outbreak of mistletoe in the limber pines of the Monument was considered a threat not only to uninfected trees at Craters but also to stands elsewhere. A decision was made to control the parasite by killing the infected trees either through poison or by cutting and burning such trees. Over the course of the program estimates are

that some 6,000 trees were killed, most of them in the areas around the loop road in the northern end of the Monument. Several of the plates show the before and after effects of this program. The authors of this report are completing a detailed analysis of the changes in vegetation structure and composition at CRMO as revealed by the comparative photographs. This analysis will be published as a bulletin of the University of Idaho Forest, Range and Wildlife Experiment Station.

A MONITORING PLAN

Not all of the comparative photos are useful for a monitoring program as they often lack the necessary detail in terms of vegetation or landform. Likewise, Although the comparative photographs are relatively comprehensive in terms of their coverage of the monument, they are not inclusive of all landscapes and vegetation types. For this reason An additional 11 photo-points were selected to monitor specific sites or vegetation types omitted from the comparative photos.

This plan proposes that 42 of the photographs be incorporated into a long-term monitoring program. These specific photographs along with the particular ecological factors which make them useful in a monitoring program are listed in Table 1.

The changes that occur in the plant communities at CRMO are for the most part gradual. This means that under normal conditions the intervals between photographs can be relatively long. This plan recommends that a program be established commencing in 1995 in which 7 photos are retaken every year. In

this way the complete set could be retaken every 6 years. The retakes should be done using good high-contrast black and white 35mm print film. Three separate photos of each scene are recommended - bracketing the best exposure. An 8 x 10 print of the best negative should then be made and incorporated into the notebook. The retakes should be done in the same month as the original if possible. For most photos this means May or June.

Based on our experience, we estimate that in most cases a set of photos for one year can be taken in less than a day. In the case of unusual environmental change at a particular photo-point, e.g., fire, eruption, or other factors, a more frequent photo interval is advised.

Black & white
100 ASA
yellow filter
Speed 60
50 mm lens

2 stops left
+ 2 stops right
of recommended
aperture

Table 1. Photo-points Appropriate for Use in a Long-term Monitoring Program. *Combined Table & Appendix*
LOCATION AND
 Photo No. Factors to Consider in the Monitoring Program

1. Photograph taken near the top of Sunset Cone looking south overlooking the park headquarters area. Original photo by C. Newman ca. 1957. Retake by G. Wright 6/1986.
 changes in limber pine density, landscape changes due to development (use with photos 86 and 87)
2. Scene of campground area, taken about 1930 (park negative #465). Original photographer unknown. Retake by G. Wright 6/1986
 changes in limber pine density, landscape changes due to development
6. View of North Crater and loop road looking west. Original by Dole 5/30/1936. Retake by G. Wright 5/30/1986.
 long-term limber pine recovery following the 1961-1963 mistletoe control program
8. North Crater Flow with Paisley Cone in background from road access from parking lot. Original by E. Menning 8/1964 park neg. # 1278. Retake by G. Wright 6/1986.
 long-term limber pine recovery following the 1961-1963 mistletoe control program
10. View of North Crater from above parking lot. Original photographer unknown, taken about 1957. Retake by G. Wright 6/1986.
 long-term limber pine recovery following the 1961-1963 mistletoe control program
15. South side of Paisley Cone taken from top of Inferno Cone. Original by Ochsner 5/1961 park neg. #738. Retake by G. Wright 6/1986.
 changes in shrub (sage and bitterbrush) patterns
17. Inferno Cone vicinity. Original photographer unknown, taken about 1957. Retake by G. Wright 6/1986.
 changes in patterns on cinder cones, and long-term limber pine recovery following the 1961-1963 mistletoe control program
19. View south from near summit of Big Craters overlooking spatter cones parking area. Original by Ochsner 6/1960. park neg. #333. Retake by G. Wright 6/1986
 visitor use impacts on the Spatter Cones

20. View south-southwest from summit of Big Craters overlooking the spatter cones. Original by Ochsner 6/1960 park neg. #490. Retake by G. Wright 6/1986.

visitor use impacts on the Spatter Cones

24. View from highway north of entrance road looking south to North Crater. Original by Dole 5/24/1936. Retake by G. Wright 6/2/1987.

long-term limber pine density in a natural area (i.e., no former control)

27. Big Cinder as seen from the summit of Broken top. Original by E. Menning 7/64 park neg. # 1226. Retake by G. Wright 6/1986.

long-term limber pine density in a natural area (i.e., no former control)

28. Big Cinder as seen from the base of Broken Top. Original by R. Limbert 1923. Retake by G. Wright 6/1986.

long-term limber pine density in a natural area (i.e., no former control)

29. Location on wilderness trail about 150 feet south of boundary sign. Original by C. Newman, ca. 1957. Retake by G. Wright 6/1986.

visitor use impacts along the wilderness trail

31. View north from wilderness parking area. Original J. S. Scofield 1935. Retake by G. Wright 6/1986.

long-term limber pine density in a harsh environment

33. View looking south along wilderness trail between Broken Top and Big Cinder. Original by J. S. Scofield 1935. Retake by G. Wright 6/1986.

long-term limber pine density in a natural area (i.e., no former control)

42. View taken along wilderness road looking south across Trench Mortar Flat. Original by J. S. Scofield 1935. Retake by G. Wright 6/1986.

landscape pattern dynamics mid-portion of the monument

43. View of Big Cinder Butte taken from north side of Echo Crater. Original by C. Newman 1955. Retake by G. Wright 6/1986.

landscape pattern dynamics mid-portion of the monument

44. View of Big Cinder Butte taken from the north part of Echo Crater. Original by R. Limbert 1923. Retake by G. Wright 6/1986.

landscape pattern dynamics mid-portion of the monument

45. Big Cinder Butte taken from wilderness trail in Trench Mortar Flats. Original by C. Newman 6/1957. Retake by G. Wright 6/1986.

long-term limber pine density in a natural area (i.e., no former control)

46. View of Half Cone Butte taken from the wilderness Trail. Original by C. Newman 1955. Retake by G. Wright 6/1986.

cinder garden stability and shrub invasion

48. View of southwest side of Crescent Butte taken from Trench Mortar Flats. Original R. Limbert 1923. Retake by G. Wright 6/1988.

cinder garden stability and limber pine invasion of shrub communities

49. Crescent Butte as seen from Trench Mortar Flats. Original by Ochsner 11/60 park neg. #631. Retake by G. Wright 6/1986.

cinder garden stability and limber pine invasion of shrub communities

51. View south from top of Big Cinder. Original by R. Limbert 1923. Retake by G. Wright 6/1986.

landscape pattern changes and changes in limber pine densities

57. View from Coyote Butte looking south. Original by R. Contor 1965 park neg. # 1367. Retake by G. Wright 6/1986.

post-fire effects and shrub and limber pine invasion

61. View up Little Cottonwood Creek taken from summit of Sunset Cone. Original by E. Menning 1964 park neg. #1341. Retake by G. Wright 6/1986.

broad landscape pattern dynamics across northern portion of the monument (use with photo 61)

62. Scene taken from second ridge northwest of summit of Sunset Cone looking toward Grassy Cone and North Flow. Original by C. Newman 1958. Retake by G. Wright 6/1986

changes in Douglas-fir densities and spread

63. Southeast side of Grassy Cone taken from cinder gardens area on south side of highway. Original by R. Contor. 7/65. park neg. # 14. Retake by G. Wright 6/1986

changes in Douglas-fir densities and spread

65. View looking down side canyon off of Little Cottonwood Canyon from hill opposite Collection box 4. Original by Zink. 7/1957. park neg. #61. Retake by G. Wright 6/1986
- aspen development and spread
71. View looking up Little Cottonwood Canyon from east slope. Original ca. 1952. Retake by G. Wright 6/1986
- aspen development and spread and mine-site reclamation
72. View from the east boundary on the north end looking towards the northeast side of Sunset Cone. Original ca. 1957. Retake (two photos by G. Wright 6/1986
- changes in Douglas-fir densities and spread and impacts of group campground
74. View from top of Big Cinder looking toward Half Cone. Original by G. Wright. 6/1986.
- long-term limber pine density in a natural area (i.e., no former control)
75. View east of Paisley Cone from road just before junction. Original by G. Wright 6/1986.
- shrub pattern changes
76. View of aspen groves in draw south of Martin Mine tailings. Original by G. Wright 6/1986.
- aspen development and spread
77. View from upper part of Little Cottonwood Canyon looking at Aspen groves to the west. Original by G. Wright 6/1986.
- aspen development and spread
78. View from Sunset toward highway flow and North Crater. Original by G. Wright 6/1986.
- shrub pattern changes in the north end
80. Slope above group campground. Original by G. Wright 6/1986.
- changes in limber pine patterns on a micro-scale
82. Lower half of Coyote Butte taken from the base. Original by G. Wright 6/1986.
- long-term successional changes following fire
83. View from top of Big Cinder looking toward Half Cone. Original by G. Wright 6/1986.
- landscape pattern changes and changes in limber pine densities

84. View of Paisley Cone taken from off the road near intersection. Original by G. Wright 6/1986.

limber pine regeneration following the 1961-63 controls

85. View of aspen groves on slopes on west side of Cottonwood Canyon. Photo taken from above. Original by G. Wright 6/1986.

aspen development and spread

88. View of Big Craters to the southwest from the road curve. Original by Zink 6/18/57. Retake by G. Wright 6/91.

shrub pattern changes and visitor use impacts

89. North Crater as seen from the loop road. Original photographer unknown, taken in the 1930s. Retake by G. Wright 6/1990.

limber pine regeneration following the 1961-63 controls

Table 1. Photo-points Appropriate for Use in a Long-term Monitoring Program.

Photo No.	Factors to Consider in the Monitoring Program
- 1	changes in limber pine density, landscape changes due to development (use with photos 86 and 87)
- 2	changes in limber pine density, landscape changes due to development
- 6	long-term limber pine recovery following the 1961-1963 mistletoe control program
8	long-term limber pine recovery following the 1961-1963 mistletoe control program
- 10	long-term limber pine recovery following the 1961-1963 mistletoe control program
- 15	changes in shrub (sage and bitterbrush) patterns
- 17	changes in patterns on cinder cones, and long-term limber pine recovery following the 1961-1963 mistletoe control program
19	visitor use impacts on the Spatter Cones
- 20	visitor use impacts on the Spatter Cones
24	long-term limber pine density in a natural area (i.e., no former control)
27	long-term limber pine density in a natural area (i.e., no former control)
- 28	long-term limber pine density in a natural area (i.e., no former control)
29	visitor use impacts along the wilderness trail
- 31	long-term limber pine density in a harsh environment
- 33	long-term limber pine density in a natural area (i.e., no former control)
- 42	landscape pattern dynamics mid-portion of the monument
- 43	landscape pattern dynamics mid-portion of the monument
- 44	landscape pattern dynamics mid-portion of the monument
- 45	long-term limber pine density in a natural area (i.e., no former control)

- 46 cinder garden stability and shrub invasion
 - 48 cinder garden stability and limber pine invasion of shrub communities
 - 49 cinder garden stability and limber pine invasion of shrub communities
 - 51 landscape pattern changes and changes in limber pine densities
 - 57 post-fire effects and shrub and limber pine invasion
 - 61 broad landscape pattern dynamics across northern portion of the monument (use with photo 61)
 - 62 changes in Douglas-fir densities and spread
 - 63 changes in Douglas-fir densities and spread
 - 65 aspen development and spread
 - 71 aspen development and spread and mine-site reclamation
 - 72 changes in Douglas-fir densities and spread and impacts of group campground
 - 74 long-term limber pine density in a natural area (i.e., no former control)
 - 75 shrub pattern changes
 - 76 aspen development and spread
 - 77 aspen development and spread
 - 78 shrub pattern changes in the north end
 - 80 changes in limber pine patterns on a micro-scale
 - 82 long-term successional changes following fire
 - 83 landscape pattern changes and changes in limber pine densities
 - 84 limber pine regeneration following the 1961-63 controls
 - 85 aspen development and spread
 - 88 shrub pattern changes and visitor use impacts
 - 89 limber pine regeneration following the 1961-63 controls
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Appendix I. Craters of the Moon Photo Points

1. Photograph taken near the top of Sunset Cone looking south overlooking the park headquarters area. Original photo by C. Newman ca. 1957. Retake by G. Wright 6/1986.
2. Scene of campground area, taken about 1930 (park negative #465). Original photographer unknown. Retake by G. Wright 6/1986
3. Entrance station area taken from hill above. Original photo by J. S. Scofield 1935, Retake by G. Wright 6/1986.
4. Scene of campground area near entrance station. Original by Bicknell 1935 (park negative #348). Retake by G. Wright 6/1986.
5. Scene of the campground area near entrance station. Original by Dole 5/30/1936. Retake by G. Wright 5/30/1986..
6. View of North Crater and loop road looking west. Original by Dole 5/30/1936. Retake by G. Wright 5/30/1986.
7. View of Paisley Cone from loop road. Original photographer unknown, taken about 1956. Retake by G. Wright 6/1986.
8. North Crater Flow with Paisley Cone in background from road access from parking lot. Original by E. Menning 8/1964 park neg. # 1278. Retake by G. Wright 6/1986.
9. Triple twist tree with Grassy Cone in the background. Original by A. Hathaway 8/1965 park neg. #1383. Retake by G. Wright 6/1986.
10. View of North Crater from above parking lot. Original photographer unknown, taken about 1957. Retake by G. Wright 6/1986.
11. Devils Orchard area, about 150 ' before entrance to parking lot, about six feet off northeast side of road. Original by C. Newman 1955. Retake by G. Wright 6/86.
12. View toward intersection of road into Devil's Orchard Original photographer unknown, taken about 1957. Retake by G. Wright 6/1986.
13. Lower north slope of Inferno Cone looking North. Original by Ochsner. 5/1961 park neg. #734. Retake by G. Wright 6/1986.
14. Lower north slope of Inferno Cone looking north. Original by Ochsner park neg. #374. Retake by G. Wright 6/1986.
15. South side of Paisley Cone taken from top of Inferno Cone. Original by Ochsner 5/1961 park neg. #738. Retake by G. Wright 6/1986.

16. View northwest from saddle on Inferno Cone. Original photographer unknown, taken about 1957. Retake by G. Wright 6/1986.
17. Inferno Cone vicinity. Original photographer unknown, taken about 1957. Retake by G. Wright 6/1986.
18. Forested slope near summit of southeast side of North Crater. Original by E. Menning 5/1964 park neg. #1167. Retake by G. Wright 6/1986.
19. View south from near summit of Big Craters overlooking spatter cones parking area. Original by Ochsner 6/1960. park neg. #333. Retake by G. Wright 6/1986
20. View south-southwest from summit of Big Craters overlooking the spatter cones. Original by Ochsner 6/1960 park neg. #490. Retake by G. Wright 6/1986.
21. View south from summit of Big Craters overlooking spatter cones. Original by Bicknell 1935. Retake by G. Wright 6/1986.
22. View of spatter cones parking area. Original photographer unknown, taken about 1955. Retake by G. Wright 6/1986.
24. View from highway north of entrance road looking south to North Crater. Original by Dole 5/24/1936. Retake by G. Wright 6/2/1987.
25. North of highway cinderpit west of headquarters turnoff, along the trail to North Crater. Original by Zink 7/1957 park neg. # 215. Retake by G. Wright 6/1986.
26. View north from northeast side Big Cinder to the northeast. Original by C. Newman 1957. Retake by G. Wright 6/1986.
27. Big Cinder as seen from the summit of Broken top. Original by E. Menning 7/64 park neg. # 1226. Retake by G. Wright 6/1986.
28. Big Cinder as seen from the base of Broken Top. Original by R. Limbert 1923. Retake by G. Wright 6/1986.
29. Location on wilderness trail about 150 feet south of boundary sign. Original by C. Newman, ca. 1957. Retake by G. Wright 6/1986.
30. Location along old Tree Molds trail near parking lot. Original by Ochsner 7/1960 park neg. # 332. Retake by G. Wright 6/1986.
31. View north from wilderness parking area. Original J. S. Scofield 1935. Retake by G. Wright 6/1986.

32. View north from wilderness parking area. Original J. S. Scofield 1935. Retake by G. Wright 6/1986.
33. View looking south along wilderness trail between Broken Top and Big Cinder. Original by J. S. Scofield 1935. Retake by G. Wright 6/1986.
34. View looking south from Broken Top across smooth lava flow toward Buffalo Cave. Original J. S. Scofield 1935. Retake by G. Wright 6/1986.
35. View looking north toward Broken Top from Wilderness trail. Original J. S. Scofield 1935. Retake by G. Wright 6/1986.
36. View looking north from near road above the small parking turnout on the road into the Tree Molds trail. Original by J. S. Scofield 1935. Retake by G. Wright 6/1986.
37. View southeast from turnout below Tree Molds parking area. Original by Scofield 1935. Retake by G. Wright 6/1986.
38. View from turnout below Tree Molds parking area looking to the northwest. Original by J. S. Scofield 1935. Retake by G. Wright 6/1986.
39. View of Broken Top and Big Cinder from about 50 m. above road. Original by J. S. Scofield 1935. Retake by G. Wright 6/1986.
40. Highway flow. Original photographer unknown, taken about 1964. Retake by G. Wright 6/1986.
41. Scene in the vicinity of Coyote Butte, Original by J. S. Scofield 1935. Retake by G. Wright 6/1986.
42. View taken along wilderness road looking south across Trench Mortar Flat. Original by J. S. Scofield 1935. Retake by G. Wright 6/1986.
43. View of Big Cinder Butte taken from north side of Echo Crater. Original by C. Newman 1955. Retake by G. Wright 6/1986.
44. View of Big Cinder Butte taken from the north part of Echo Crater. Original by R. Limbert 1923. Retake by G. Wright 6/1986.
45. Big Cinder Butte taken from wilderness trail in Trench Mortar Flats. Original by C. Newman 6/1957. Retake by G. Wright 6/1986.
46. View of Half Cone Butte taken from the wilderness Trail. Original by C. Newman 1955. Retake by G. Wright 6/1986.
47. View looking south from the area of Trench Mortar Flats in

- the vicinity of Coyote Butte. Original by R. Limbert 1923. Retake by G. Wright 6/1988.
48. View of southwest side of Crescent Butte taken from Trench Mortar Flats. Original R. Limbert 1923. Retake by G. Wright 6/1988.
 49. Crescent Butte as seen from Trench Mortar Flats. Original by Ochsner 11/60 park neg. #631. Retake by G. Wright 6/1986.
 50. Area in Trench Mortar Flats south of Big Cinder Butte. Original by R. Limbert 1923. Retake by G. Wright 6/1988.
 51. View south from top of Big Cinder. Original by R. Limbert 1923. Retake by G. Wright 6/1986.
 52. View to the southeast toward Crescent from top of Big Cinder. Original by R. Limbert 1923. Retake by G. Wright 6/1986.
 53. View of Crescent Butte from Northeast side of Echo Crater. Original by C. Newman 1955. Retake by G. Wright 6/1986.
 54. View from the top of Big Cinder looking southeast to Watchman. Two originals a) by R. Limbert 1923, b) by C. Newman 1955. Retake by G. Wright 6/1986.
 55. View from west slope of Echo Crater looking toward the west to North Laidlow Butte. Original by C. Newman 1955. Retake by G. Wright 6/1986.
 56. View looking northeast from northeast side of Coyote Butte. Original by Dole 5/27/1936. Retake by G. Wright 6/2/1988.
 57. View from Coyote Butte looking south. Original by R. Contor 1965 park neg. # 1367. Retake by G. Wright 6/1986.
 58. View south and east towards the Watchman from Echo Crater. Original by R. Limbert 1923. Retake by G. Wright 6/1986.
 59. Echo Crater from the north. Original by J. S. Scofield 1935. Retake by G. Wright 6/1986.
 60. View of the south rim of Echo Crater looking toward the Watchman. Original by R. Limbert 1923. Retake by G. Wright 6/2/1988.
 61. View up Little Cottonwood Creek taken from summit of Sunset Cone. Original by E. Menning 1964 park neg. #1341. Retake by G. Wright 6/1986.
 62. Scene taken from second ridge northwest of summit of Sunset Cone looking toward Grassy Cone and North Flow. Original by C. Newman 1958. Retake by G. Wright 6/1986

63. Southeast side of Grassy Cone taken from cinder gardens area on south side of highway. Original by R. Contor. 7/65. park neg. # 14. Retake by G. Wright 6/1986
64. View looking southwest over the Elymus patch in the north end. Original by Zink 1955. Retake by G. Wright 6/1986
65. View looking down side canyon off of Little Cottonwood Canyon from hill opposite Collection box 4. Original by Zink. 7/1957. park neg. #61. Retake by G. Wright 6/1986
66. View down the ravine to spring # 3. Original by Zink 1957. Retake by G. Wright 6/1986
67. View of north side road from spring # 3. Original by Zink 1957. Retake by G. Wright 6/1986
68. Looking down Little Cottonwood Canyon from hill opposite Collection box 4. Original by Zink. 7/1957. park neg. #58. Retake by G. Wright 6/1986
69. View of road by Little Cottonwood Canyon. Original by Zink 12/1955. park neg. # 96. (Retake includes two photos; exact retake by R. G. Wright 6/86 not possible due to tree growth.
70. Panorama of Little Cottonwood Canyon. Original by Zink 7/1957. park neg. # 53. (A set of two photos). Retake by G. Wright 6/1986
71. View looking up Little Cottonwood Canyon from east slope. Original ca. 1952. Retake by G. Wright 6/1986
72. View from the east boundary on the north end looking towards the northeast side of Sunset Cone. Original ca. 1957. Retake (two photos by G. Wright 6/1986
73. View looking north from entrance "y". Original ca. 1935. Retake by G. Wright 6/1986
74. View from top of Big Cinder looking toward Half Cone. Original by G. Wright. 6/1986.
75. View east of Paisley Cone from road just before junction. Original by G. Wright 6/1986.
76. View of aspen groves in draw south of Martin Mine tailings. Original by G. Wright 6/1986.
77. View from upper part of Little Cottonwood Canyon looking at Aspen groves to the west. Original by G. Wright 6/1986.
78. View from Sunset toward highway flow and North Crater. Original by G. Wright 6/1986.

79. View from Sunset south over the park. Original by G. Wright 6/1986.
80. Slope above group campground. Original by G. Wright 6/1986.
81. Backside (northwest side) of Sunset looking west. Original by G. Wright 6/1986.
82. Lower half of Coyote Butte taken from the base. Original by G. Wright 6/1986.
83. View from top of Big Cinder looking toward Half Cone. Original by G. Wright 6/1986.
84. View of Paisley Cone taken from off the road near intersection. Original by G. Wright 6/1986.
85. View of aspen groves on slopes on west side of Cottonwood Canyon. Photo taken from above. Original by G. Wright 6/1986.
86. Campground and headquarters area view to the southwest. Original photographer unknown, taken in the 1930s. Retake by G. Wright 5/91.
87. Campground and headquarters area view to the south-southwest. Only slightly different than # 86. Original photographer unknown, taken in the late 1920s. Retake by G. Wright 5/91.
88. View of Big Craters to the southwest from the road curve. Original by Zink 6/18/57. Retake by G. Wright 6/91.
89. North Crater as seen from the loop road. Original photographer unknown, taken in the 1930s. Retake by G. Wright 6/1990.

CRMO PHOTO: INTS

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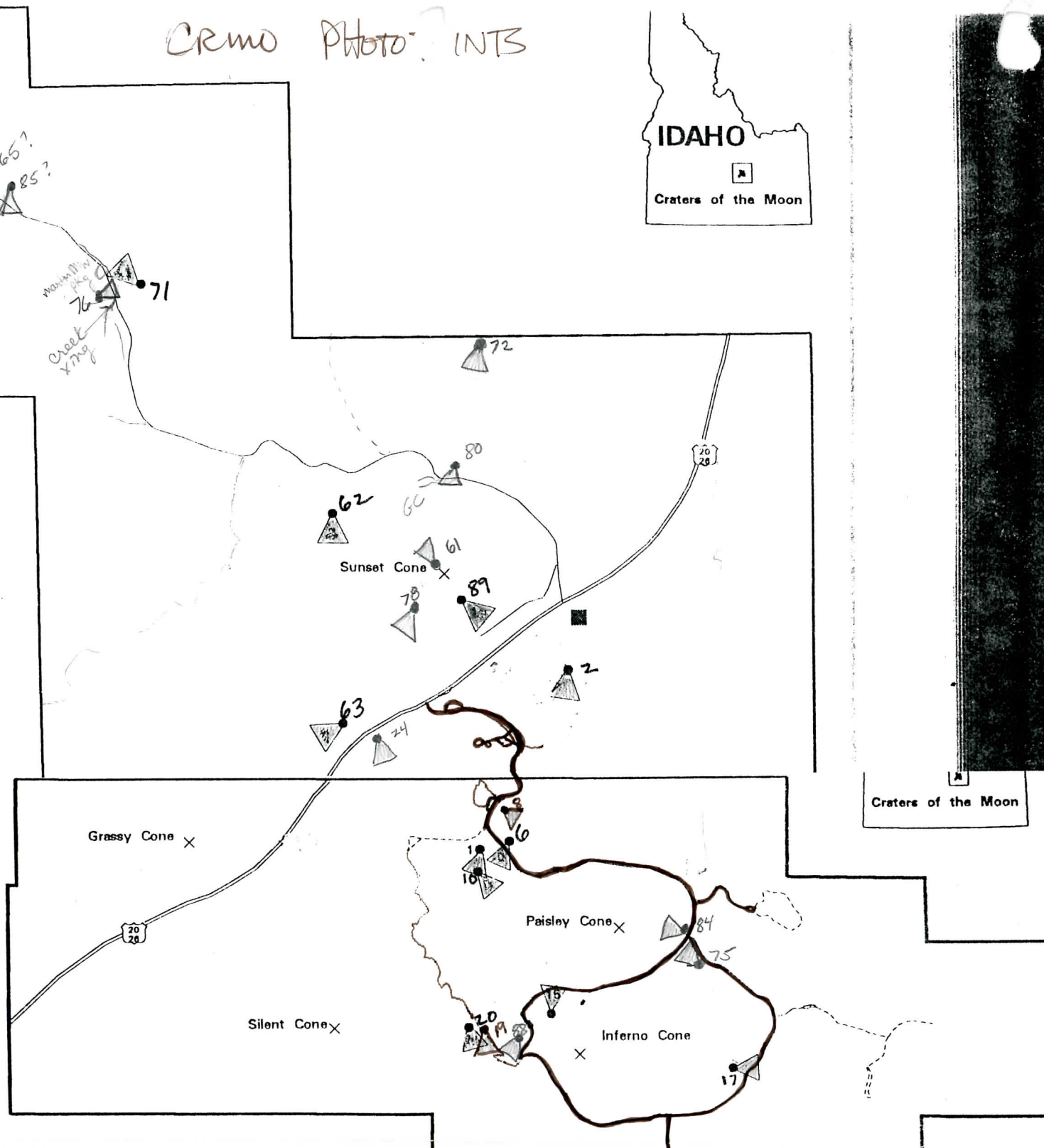
Craters of the Moon

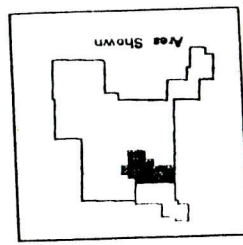
Craters of the Moon

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-  State Highway
-  Roads
-  Trails
-  Park Landmarks
-  Photo Points





- Photo Points
- Park Landmarks
- Trails
- Inset Border

