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Craters of the Moon
National Monument

UNITED STATES
DEPARTMENT OF THE INTERIOR
National Park Service
Region Four Office

Superintendent	
Sup. Park Rangers	
Adm. Asst.	
Maintenance Man	
Naturalist	

FIRST FIELD INVESTIGATION REPORT

of

KIPUKA ADDITION TO
CRATERS OF THE MOON NATIONAL MONUMENT

INVESTIGATION DATE - SEPTEMBER 3, 1958

BLAINE COUNTY, IDAHO

Report Prepared by:

Ecology: Dr. Adolph Murie, Biologist,
Grand Teton National Park
Report Coordinated by James E. Cole,
Chief, Branch of National Park
System Planning

February 1959



Summary Section: Grassland unmodified by the grazing of domestic

stock is very scarce in the Snake River Plain. The few existing relics will vanish in time unless preserved. The proposed addition of 7,583 acres will place under protection of the National Park Service a 180 acre tract of native grassland surrounded by a recent lava flow. The kipuka, as such an area is called, will have natural protection of a half or more miles of recent flow of scori^{ous} lava, commonly designated as aa lava.

Significance of the kipuka is wholly scientific. The kipuka consists of some 180 acres of sagebrush-grassland association which is believed not to have been grazed by domestic stock or otherwise altered by white men. Continued preservation will furnish scientists opportunities for ecological investigations to determine what constituted the natural vegetation and soil profile of the Snake River Plain, and what floral and soil modifications have occurred under various types of land utilization on contiguous areas.

No such similar area exists in Craters of the Moon National Monument. The proposed addition will have no outstanding scenic features, and no direct interpretative or recreation possibilities.

Conclusions: An opportunity to preserve soils and vegetation in grazing regions unaltered by white man occurs infrequently now. Addition to an existing National Monument of lands including a parcel of unmodified grassland surrounded by a natural buffer zone

is warranted and highly desirable in order to insure that the grassland in the kipuka will remain inaccessible to domestic stock.

Recommendation: The addition to Craters of the Moon National Monument of a kipuka containing approximately 180 acres of grassland and 7,403 acres of land covered with a recent lava flow which will connect the kipuka with the Monument is recommended.

Estimated Costs: No additional funds for management and protection will be required the first year. A quarter of a mile of sheep-proof fencing across the neck of the embayment leading toward the kipuka from the east may be desirable. The estimated cost is \$300.

Scenic Category: Snake River Plain Section of Columbia Plateaus Province. (After Fenneman)

Scientific Categories:

Geologic - Recent lava flow of the rough, jagged type called aa lava.

Biologic - Ecological, sagebrush grassland climax. (Not included in Dice's list of Biotic provinces).

Name: Proposed Kipuka addition to Craters of the Moon National Monument.

Authorization and Purpose: Investigation requested by Ben H.

Thompson, Chief, Division of Recreation Resource Planning by memorandum dated July 11, 1958, to ascertain ecological importance of a small island of undisturbed grassland surrounded by a recent lava flow. Such an inclosure is called a kipuka from the Hawaiian word for an area of vegetation encompassed completely by lava.

Accessibility: The kipuka is both difficult to locate and reach.

A rough road about 25 miles long over lava beds and through sage brush leads from U.S. Highway 20 to an area called Laidlow Park. Vehicle tracks across a sagebrush plain take off from this rough road toward an embayment in the lava. From the end of this bay the kipuka is separated by about a half mile of scori^{ose}ous lava over which an exceedingly rough and undeveloped trail has been made by the passage of a few white men and an unknown number of Indians. Inaccessibility of the kipuka is a distinct asset since its ecological value will rest largely upon the degree to which it remains undisturbed by man and domestic stock.

Background Information: Significance of this area was called to the attention of the National Park Service by receipt of a report (copy appended) entitled "Proposed Addition to Craters of the Moon National Monument" by ecologists Dr. E. W. Tisdale, University of Idaho and M. A. Fosberg, Washington, D.C. In 1956, Dr. Tisdale and Mr. Min Hironika, an ecologist from the U. S.

Forest Service, Boise Research Center, made a preliminary investigation of the Kipuka and established two study sites.

No report on this study has been produced.

Major Characteristics: The importance of this proposed addition to Craters of the Moon National Monument is wholly scientific. It has no outstanding scenic, or known prehistoric or historic features, and no direct interpretation or the ordinary kind of recreation possibilities. The kipuka would add a feature not now present in the Monument.

Biologically this kipuka exhibits a small island of native sagebrush-grassland association, which has been undisturbed, so far as can be determined, by white man or his domestic stock. Its isolation will help insure its preservation in as natural a condition as present-day or future conditions permit with a minimum of attention from protection personnel.

Of possibly equal importance is soil formation. In places the Snake River Plateau is beginning to be covered thinly with soil formed from the lava. Preservation of the kipuka will present also opportunities for soil research and for soil-plant relationships.

Preservation of a relic area of about 180 acres containing mature soils and climax vegetation such as is not found in the Monument nor elsewhere in the surrounding region presents an outstanding opportunity for scientific research.

Need for Conservation: Retention of this kipuka in its pristine condition has occurred because of its relatively small size, and the half mile or more of jagged lava surrounding it. A Trail could be constructed quite easily which would make this sheltered island accessible as a winter holding pen for sheep.

The availability of adequate grassland for the comparatively few flocks of sheep grazed in Laidlow Park has, so far, made unnecessary utilization of this kipuka. Eventually pressures exerted by an expanding civilization will engulf this kipuka also, especially as well-protected areas where sheep can be held easily during inclement weather become scarce or the vegetation on them becomes ravished.

Possible Development: Not only is no development contemplated for the proposed addition, but none should or need ever be made with the possible exception of short stretches of sheep-proof fence if such protection should ever be found necessary.

Practicability of Administration: While this proposed addition is isolated from Monument headquarters and the normally patrolled routes of protection personnel, it is too far removed from the main roads to be molested by Monument visitors. It contains no features differing in any visible degree to the ordinary person from hundreds of square miles of the surrounding regions. The relatively few scientists who visit it would be the first to

protect its values. Administration, operation, protection, and public use should present no problems unless underground sources of water for irrigation are found and developed in nearby Laidlow Park.

Local Attitude: The proposed addition was not discussed locally.

The only person living in Laidlow Park, a tenant dry-farmer, was visited but his opinion was not solicited.

Probable Availability: With the exception of the 320 acres comprising the west half of Section 16, all of the proposed addition is public domain. No Bureau of Land Management officials have been approached, but in view of the lack of any known use that can be made of land covered with aa type lava, there should be little question as to its availability.

Acquisition by the Service of the 320 acres in Section 16 owned by the State of Idaho should not present much of a problem. This half section, however, cannot be exchanged; a fact determined in connection with previous acquisition of State school lands in Craters of the Moon National Monument. The State of Idaho was very cooperative in previous negotiations and there appears to be no reason why the State would object to disposing of this 320 acres which is covered solidly with lava save some ten acres. An attempt should be made to have the State agree not to sell this half section to another party until the National Park Service has had time to acquire it.

Persons Interested:

Dr. F. R. Fosberg, National Academy of Sciences,
Washington, D.C.

Dr. E. W. Tisdale, University of Idaho, Moscow,
Idaho

Mr. Min Hironika, Boise Research Center, U.S. Forest
Service, Boise, Idaho

Doctors Fosberg and Tisdale are interested in the proposed addition because of the kipuka which has preserved and can continue to protect a small tract of native grassland in its natural condition. Mr. Hironika has instituted studies for the Boise Research Center designed to determine what comprised the climatic vegetational complex of the grasslands in this part of the Snake River Plain.

Other Land Resources or Uses: The kipuka could support a small band of sheep for a short time in winter providing snow was present to furnish water for the animals and a trail was built across a half mile of rough lava. The remainder of the proposed addition consists of aa type lava, and has no known use or value.

Land Ownership or Status:

Public Domain	7263.20 acres
State School lands	320.
	<u>7583.20 acres</u>

Estimated Land Values: Value of 320 acres of State school land is the only issue. The Idaho Admission Act requires that these lands be sold at not less than ten dollars an acre. In a previous purchase from the State of Idaho covering 800 acres the land was acquired at approximately \$3.50 per acre under friendly condemnation.

Since all but 10 acres of the 320 acres consists of raw lava, it appears probably that this State School land may be acquired for less than \$3,200, possibly for about half that figure.

Boundaries and Acreages: The boundary suggested by Superintendent Henderson and Biologist Murie and delineated on the map attached to their joint report entitled "Proposed Addition to Craters of the Moon National Monument" has been accepted without alteration. The attached map NM CRM-7100, showing the boundary of the proposed addition, and its relationship to the south-western corner of the Monument, has been prepared from General Land Office township plats. The location of the kipuka and edges of lava flows shown on this map were defined by the General Land Office surveys of 1918 and 1937. No topographic map of the area under consideration has been produced.

Lands suggested and proposed for addition to Craters of the Moon National Monument are the sections and fractional sections in Township 1 South, Range 24 East, Boise Meridian, Idaho, listed below:

All Section 3	Acreage	350.04
All Section 4	"	350.08
All Section 5	"	350.60
All Section 8	"	640.00
All Section 9	"	640.00
All Section 10	"	640.00

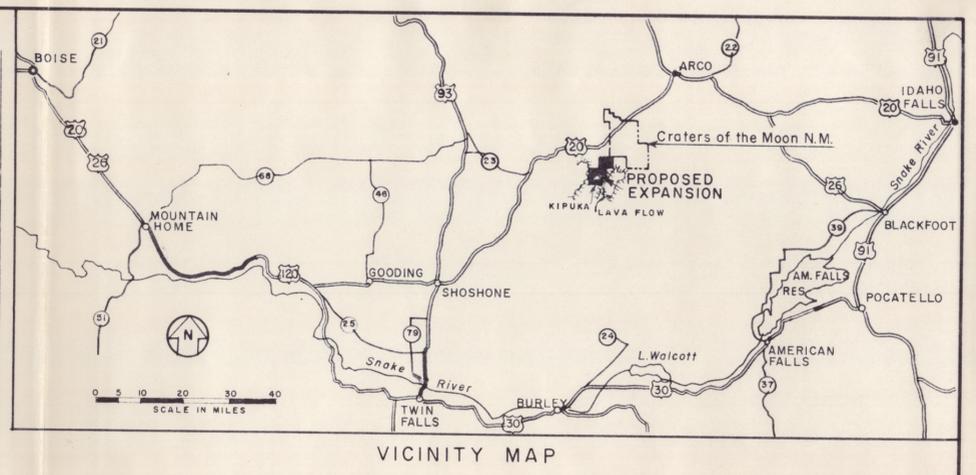
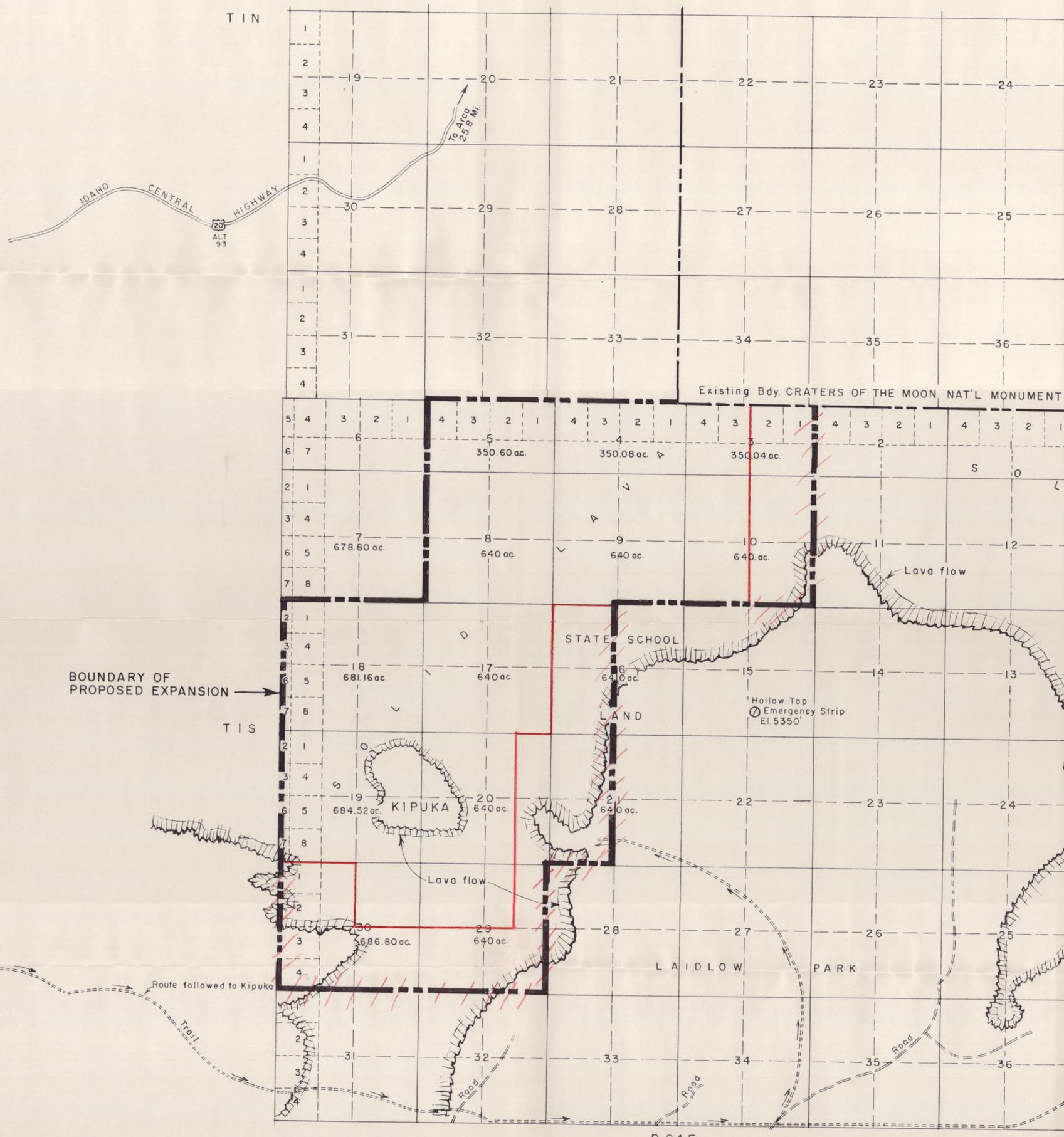
West half Section 16	Acreage	320.00
All Section 17	"	640.00
All Section 18	"	681.16
All Section 19	"	684.52
All Section 20	"	640.00
West half Section 21	"	320.00
All Section 29	"	640.00
All Section 30	"	<u>686.80</u>
		7583.20

Exclusive of the 180 acres of grassland in the Kipuka, the proposed extension would include about 400 acres of additional grasslands. The remainder of the land, some 7,000 acres, is covered solidly with scori^{ace}ous lava of the aa type. The small amount of additional grassland is believed to be economically insignificant. Laidlow Park is said to lack sufficient surface water for complete utilization of its forage by sheep.

Development of water for irrigation in Laidlow Park from underground rivers is a possibility since similar areas in Idaho are being irrigated in this manner. Should underground water become available the kipuka would require the buffer-zone protection proposed against contamination from exotic species of cereal crops and weeds introduced by intensified agriculture.

Attachments: Report: "Proposed Addition to Craters of the Moon National Monument"

Map



BASIC DATA: G.L.O. PLATS. Surveys dated
Oct 2, 1917
June 1, 1937

UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE		N.P.S. REGION FOUR FOR N.P.S. DATE 11/7/1958 DRAWN BY A. LaRiviere CHKD BY J. COLE SHEET 1 OF 1
MAP SHOWING PROPOSED KIPUKA EXPANSION CRATERS OF THE MOON NATIONAL MONUMENT - IDAHO		DRAWING NO. N. M. CRM - 7100

10 0 10 20 40 80
SCALE: ONE INCH = 40 CHAINS (2640 FEET)

C O P Y

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
Craters of the Moon National Monument
Arco, Idaho

October 20, 1958

Memorandum

To: Regional Director, Region Four

From: Superintendent, Craters of the Moon National Monument

Subject: Report on Proposed Addition to Craters of the Moon

The enclosed report in quintuplicate prepared by Biologist Murie and signed by him and me recommends acquisition of the kipuka located southwest of the Monument. We investigated the kipuka in accordance with instructions issued from your office and dated August 19, 1958.

s/t/ Floyd A. Henderson
Superintendent

PROPOSED ADDITION
TO CRATERS OF THE MOON NATIONAL MONUMENT

Superintendent Floyd Henderson
Biologist Adolph Murie

In a communication dated August 19, 1958 from George L. Collins, Regional Chief, Division of Recreation Resource Planning, Biologist Murie was assigned to assist Superintendent Henderson in investigation of a "kipuka" (a relict area surrounded by lava) lying about four miles southwest of the southwest corner of the Craters of the Moon. In a recent report ecologists E. W. Tisdale, University of Idaho, and M. A. Fosberg, Washington, D.C., had proposed adding this kipuka to the monument in order to assure its permanent protection. They believed that the scientific values of the kipuka were such as to merit monument protection. The kipuka was visited on September 3, 1958 by Superintendent Henderson, Biologist Murie, Seasonal Ranger Sanchez, and old-time resident John O'Connell.

Location: According to a map in the Tisdale-Fosberg report, the kipuka lies in Section 19, Township 1 South, Range 24 East, Boise Meridian, Idaho. However a county map shows almost half of the kipuka overlapping into Section 20. Its total area is about 180 acres. To reach the kipuka one leaves Highway No. 20 about 8 or 10 miles northeast of Carey, and follows a rough road through sage and over lava beds for 25 or 30 miles into an extensive

sage-grass area called Laidlow Park. The kipuka lies to the west of Laidlow Park.

Nature of the Area: The kipuka consists of a gently slope knoll, 180 acres in extent, surrounded on all sides by raw, recent lava (an extremely broken up type of lava) about a mile or more in width. According to Tisdale and Fosberg "the vegetation appears to belong to the regional climax for the general area and the soil profile is well developed." They recognize in the area two associations of the sage-brush grass climax. "The first is the Artemisia tripartita - Festuca-Agropyron community, characterized by the presence of a number of perennial forbs such as Lupinus, Astragalus spp., Crepis acuminata, etc. This association occupies the bulk of the area and probably represents the climatic climax for the region. The second association is the Artemisiae tridentata - Agropyron - Festuca which is characterized by fewer forbs than the first community and by a predominance of Agropyron spicatum over Festuca idahoensis." We also noted in the area Balsamorhiza, Chrysothamnus and Purshia. The bitterbrush and sagebrush was especially large bordering the lava.

There were signs of considerable rodent activity in the area and we noted several coyote scats.

When our party approached the kipuka from the east we followed the car trail into a small inlet

of grassland almost surrounded by lava. This inlet was heavily infested with cheat grass which suggested that it might have been utilized as a holding pen for sheep. The range outside was in good condition. It was from this inlet that we hiked across almost a mile of lava to the kipuka. Enroute, we encountered a faint rough trail, marked by rock cairns, the trail mentioned later in this report by Mr. Hironaka.

Recent Discovery and Scientific Studies of Kipuka.

Min Hironaka, who has carried on range research with the Boise Research Center, U. S. Forest Service, in a personal letter to Murie described some of the recent history and investigations of the kipuka as follows:

"This particular kipuka was spotted by Dr. Tisdale and me during the fall of 1955. It is located on most detailed maps of the state, such as the BLM map and state highway maps. However it was not until 1956 that we journeyed across the lava to the kipuka. By chance, we started across very near the trail and soon cut across it and followed it to the kipuka. The trail was very faint but well marked by small rocks piled on one another (two or three rocks) indicating the way. The trail itself was extremely faint because the aa (the type of lava) was dark in color, indicating that it was not disturbed for a long time. With the traffic that has gone over it since, the individual pieces of lava have been turned over and

also fragmented giving now a well marked trail by the reddish color. More than two dozen men have crossed it at one time or another since 1956 and our crew (4-5 men) have made about five or six trips to the kipuka.

"We started a vegetation-soil study on the kipuka in 1956 as part of our overall study of the sagebrush communities in southern Idaho. To date we have two study sites there with corresponding soil pits - one where Artemisia tridentata is the dominant shrub and the other where Artemisia tripartita is. We plan to continue to do more work on the kipuka in the future. I am sorry to say I do not have any of the data with me (they are filed at Moscow) so I cannot make available any of the pertinent quantitative information. Because we have not made an all-out effort to study the kipuka we do not have sufficient data to report on the kipuka alone. How much of the soil analysis have been completed I do not know. So a report concerning the kipuka (at least from the vegetation-soil aspect) will not be forthcoming for a few more years."

Scientific Value. The value of relict areas of native grasslands for the study of grassland ecology is of course well recognized. Because grasslands are usually readily accessible for grazing or crop uses, undisturbed areas showing the climatic vegetation climax of grasslands early become rare. Hence the great value which ecologists have

placed on the kipuka under consideration. It appears, because of the roughness of the surrounding lava, that it has not been accessible to domestic livestock. There has as yet been no incentive for using the grazing on the kipuka because ample vegetation for grazing has been available without crossing the lava. (Apparently shortage of water has limited the use of range in adjoining Laidlow Park.)

Not only do we have here an area that has been protected from domestic grazing in the past, but the nature of the lava is such that with proper administration its present pristine condition can readily be preserved for the future. If not given formal official protection it could be invaded by livestock by the construction of a trail.

In their report on the area Tisdale and Fosberg give three reasons for adding it to the monument.

"1. The kipuka contains mature soils and vegetation such as do not occur in the present monument area and which are not found commonly elsewhere in the region due to grazing pressure.

"2. While the area is protected from normal grazing by the raw lava flows, it could be made accessible to livestock and at present there is no legal restriction to prevent the area from being used.

"3. The area between the kipuka and the national monument consists mainly of raw lava with little or no grazing value. It should be possible to connect the area without withdrawing any appreciable amount of grazing land."

Hironaka writes as follows concerning the value of the kipuka for range studies: "As far as the importance for making range studies, in my opinion, it has great possibilities. In Idaho areas that have not been disturbed by livestock are quite rare, especially in the low rainfall areas. Actually this is the only area that we feel quite confident that livestock have not been (in any great quantity anyway). Some people disagree but we cannot see why any shepherd would want to traverse the lava with a band of sheep when the north end of the park still remains in good grass cover. The loss in crippled animals would be high. If the lava were of the ropy type it would be another matter.

"We freely admit that big game may have crossed to the kipuka and possibly were even hunted by Indians. We did find evidence of Indians there, an arrowhead (of course it is also assumed that the rock trail markers were put up by Indians.) I have seen antelope cross lava near the Craters of the Moon and they appear to have no difficulty.

"So this area would be an ideal situation in trying to reconstruct what some of the vegetation was like

in the immediate vicinity and areas with similar soils that are now in depleted condition. You may have also noticed the amount of pedestalled plants on the area.

[We did.] This is most interesting, for in the past we have been led to believe it was mainly due to overgrazing regardless of soil type or condition. Here would be an excellent opportunity to learn more about pedestalled plants and 'erosion.' Cheatgrass is also present near the knob. One other thing of interest is the evidence of the amount of rodent and rabbit activity. We have no idea whether this is normal or abnormal. We have seen some old droppings of what appear to be coyote on the trail, but no recent sign. No doubt there are many other aspects that can be studied here but these are a few that come to my mind at the moment."

We agree with Tisdale, Fosberg, and Hironaka that the kipuka has outstanding values for scientific research, and for that reason deserves special protection. So far as we know there are no comparable areas of vegetation within the present monument boundaries so well protected from outside invasion. The kipuka would add a feature not now present in the monument.

Boundaries: In the delineation of boundaries connecting the kipuka to the monument we have tried to take in enough lava to protect the kipuka, and have avoided includ-

ing any grazing lands except slight indentations into the lava in two or three places. The boundaries for the northern part of the addition are somewhat arbitrarily drawn. If a geological reconnaissance of this area were made perhaps some adjustments of the boundary might be found desirable, from the geological angle.

The boundary of the suggested addition as shown on the map incloses about $11\frac{1}{2}$ sections. All the land is federally owned except one-half section of lava in Section 16 which is State land. If desirable this half section could be excluded. It is included to avoid a jog in the boundary line and give slightly greater protection to the kipuka. The part of the boundary surrounding the kipuka appears to be satisfactory, but about the minimum required for its protection. The northern part of the suggested boundary is more arbitrarily drawn.

The sections which are included in the above suggested addition are as follows (all in Township 1 South, Range 24 East): Lower half of 3, 4, and 5; all of Sections 8, 9, 10, 17, 18, 19, 20, 29 and 30; the west half of Sections 21 and 16.

If the kipuka were to be added to the monument as a detached unit, the suggested boundaries surrounding it would on three sides be the same as though it were attached to the monument. The detached unit would include the following sections: All of Sections 18, 17, 19, 20,

30, and 29; and the west half of Sections 16 and 21. Here again one-half section of State land (Section 16) has been included but if necessary could be omitted without undue loss of lava protection.

The land involved in a boundary suggestion connecting the kipuka to the monument is all federal-owned, and administered by the Bureau of Land Management except Section 16 which belongs to the State.

The extensive grazing lands in Laidlow Park are chiefly public lands in the Bureau of Land Management. In Township 1 South, Range 24 East, Sections 16 and 36 belong to the State, and a homestead is located on the north half of Section 23, according to records in the courthouse at Haley. An emergency airstrip is located in Section 15. A Mr. Daly is dry farming on about 800 acres in the northern part of Laidlow Park.

Conclusions: In our opinion, because of the high value of the kipuka for research, it deserves permanent protection such as it would have if added to the monument. It could be joined to the monument with no significant infringement on grazing land. The addition would consist of the kipuka and enough surrounding fresh lava to insure its protection.

s/Floyd A. Henderson 10/17/58
t/Floyd Henderson, Superintendent,
Craters of the Moon National
Monument

s/Adolph Murie
t/Adolph Murie
Biologist
National Park Service

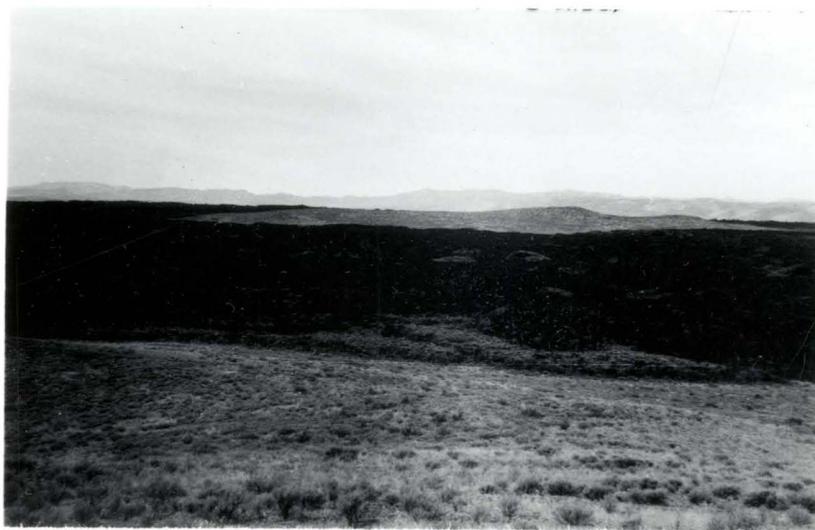


Figure 1. The kipuka lies just beyond the field of black lava which is a little less than a mile across at this point. The photograph was taken from a knoll located in Section 21, so the view is toward the west.



Figure 2. Crossing the aa lava to the kipuka lying just beyond the lava.

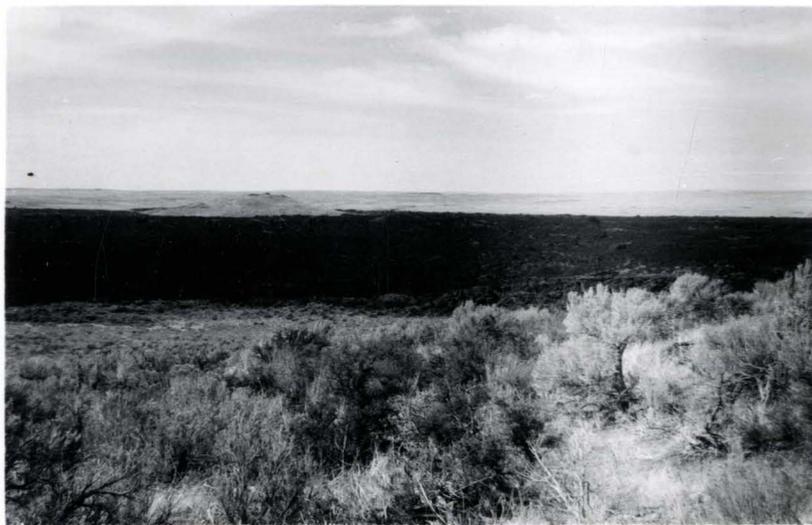


Figure 3. Photo taken from kipuka looking eastward.

Proposed Addition to Craters of the Moon National Monument

E. W. Tisdale and M. A. Fosberg

Location: Section 19, Township 1 South, Range 24 East, Boise meridian. About 4 miles southwest of the southwest corner of the Craters of the Moon National Monument.

Size: Approximately 180 acres.

Nature of Area: This is an area of sagebrush grass vegetation existing on relatively mature soils and apparently ungrazed by domestic livestock. The area is surrounded by raw recent lava flow of the "aa" type a mile or more in width. The vegetation appears to belong to the regional climax for the general area and the soil profile is well developed.

Topography: The kipuka is slightly elevated above the adjacent area and is undulating to hilly with two knolls of a rocky nature. The general elevation is 5,300 to 5,400 feet above sea level.

Soils: All of the kipuka has deep, well developed residual soil which shows some possible influence of loess. Zonally the kipuka belongs in the Chestnut Great Soil group. There is considerable variation with shallower soils showing a distinct lime layer on the south and west slopes of the knolls. In general the soils on the kipuka are more mature than any seen in the present Craters of the Moon National Monument area.

Vegetation: Two associations of the sagebrush grass climax are present. The first is the Artemisia tripartita/Festuca/Agropyron community, characterized by the presence of a number of perennial forbs such as Lupinus _____, Astragalus spp., Crepis acuminata, etc. This association occupies the bulk of the area and probably represents the climatic climax for the region. The second association is the Artemisia tridentata/Agropyron/Festuca which is characterized by fewer forbs than the first community and by a predominance of Agropyron spicatum over Festuca idahoensis.

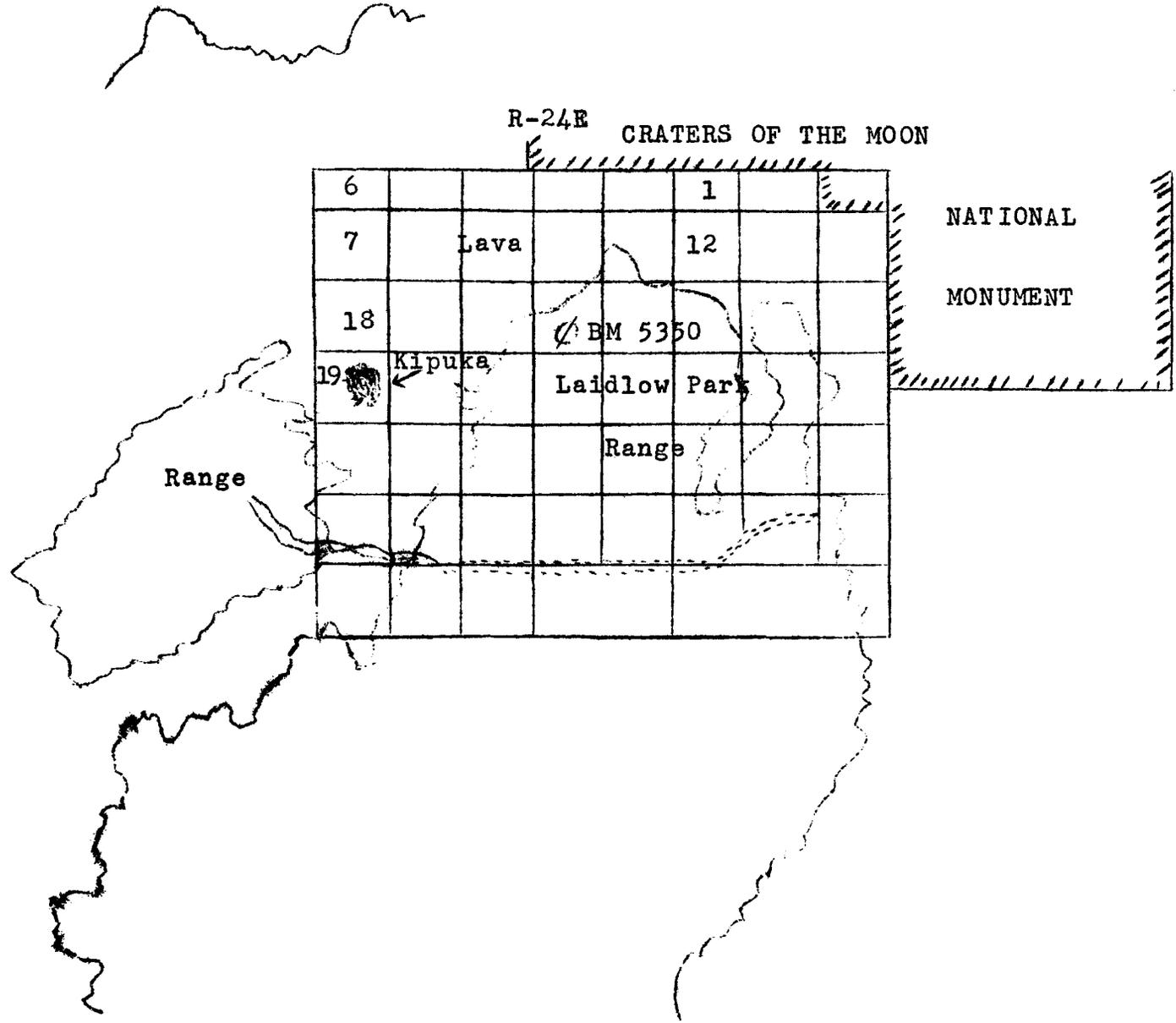
Present Condition: Both vegetation and soil show some degree of disturbance which may be due to the rodent population which appears to be rather high. On the knolls, however, some of the surface disturbance may reflect the instability of the shallow soils formed on these exposed areas. There is some indication that Indians may have hunted on the area but no remains of big game animals were found.

Reasons for Including this Area in the National Monument:

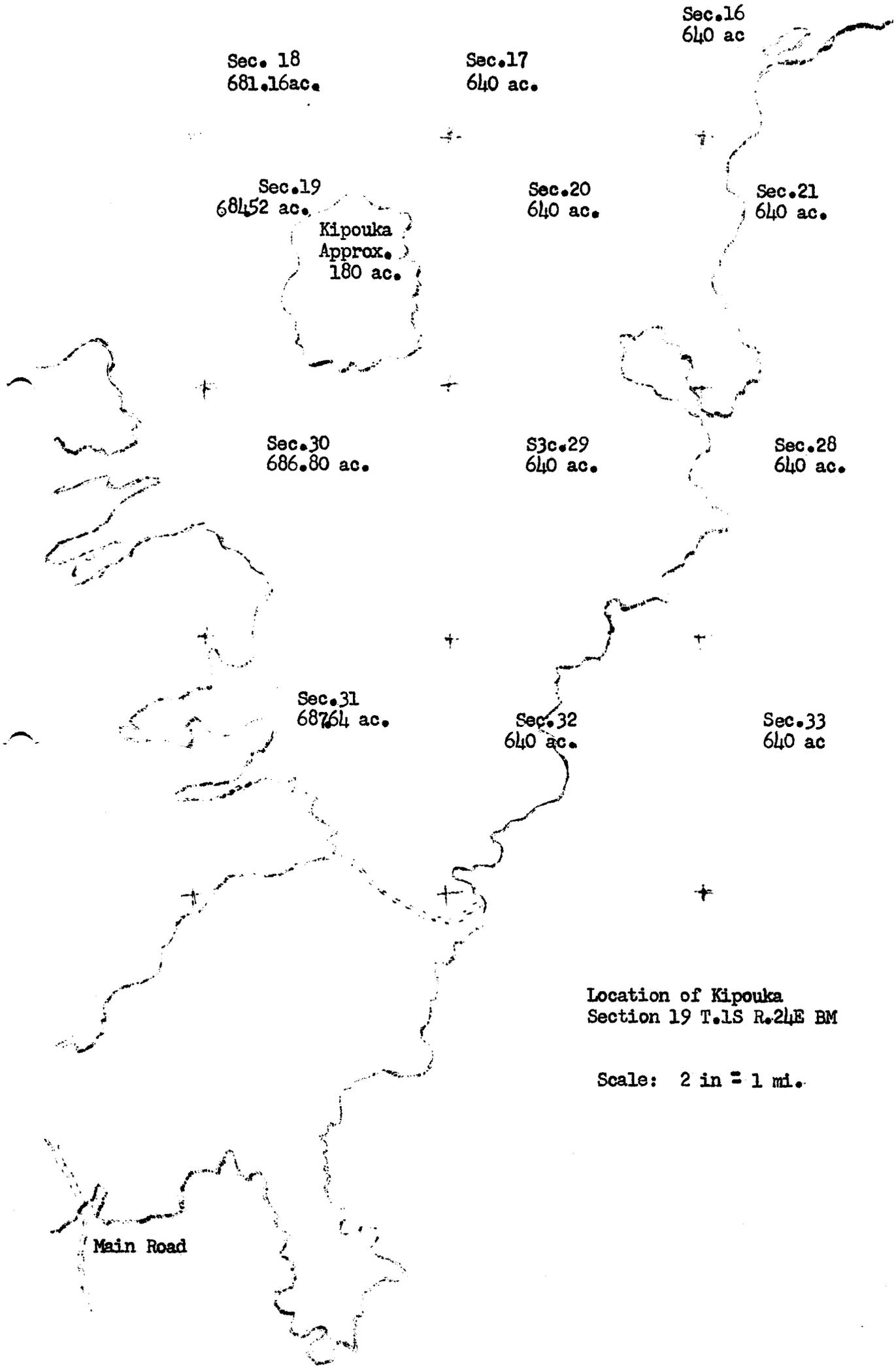
1. The kipuka contains mature soils and vegetation such as do not occur in the present Monument area and which are not found commonly elsewhere in the region due to grazing pressure.

2. While the area is protected from normal grazing by the raw lava flows, it could be made accessible to livestock and at present there is no legal restriction to prevent the area from being used.
3. The area between the kipuka and the National Monument consists mainly of raw lava with little or no grazing value. It should be possible to connect the area without withdrawing any appreciable amount of grazing land.

R-24E CRATERS OF THE MOON



T1S



Sec. 18
681.16 ac.

Sec. 17
640 ac.

Sec. 16
640 ac

Sec. 19
68452 ac.

Kipouka
Approx.
180 ac.

Sec. 20
640 ac.

Sec. 21
640 ac.

Sec. 30
686.80 ac.

Sec. 29
640 ac.

Sec. 28
640 ac.

Sec. 31
68764 ac.

Sec. 32
640 ac.

Sec. 33
640 ac

Main Road

Location of Kipouka
Section 19 T.1S R.24E BM

Scale: 2 in = 1 mi.