

DESIGNATION ORDER

SHASTA MUDFLOW RESEARCH NATURAL AREA

By virtue of the authority vested in me by the Secretary of Agriculture under Title 36, Section 251.23, of the Code of Federal Regulations, I hereby designate as the Shasta Mudflow Research Natural Area the lands described in the attached report by Norden H. Cheatham and John C. Heinan dated June 28, 1971; said lands shall hereafter be administered as a research natural area subject to the said regulations and instructions thereunder.

10-12-71

(Date)

Edward P. Cliff

Chief

Establishment Report

SHASTA MUDFLOW RESEARCH NATURAL AREA within the Shasta-Trinity National Forests Siskiyou County, California

I. INTRODUCTION

A. General

The southeast slopes of Mt. Shasta are characterized by a series of mudflows of volcanic materials that descended in creek channels and on slopes over a period of thousands of years. While such mudflows are found throughout the Cascade Volcanic Province of Oregon and northern California, the Mt. Shasta mudflow has the advantage of great diversity in number of flows, extent, pattern of spread, vegetative mantle, and sequence of buried but well-preserved soil profiles.

This area is of great interest to the Department of Soils and Plant Nutrition of the University of California. The geomorphology and associated ecosystems have stirred international interest. Representatives of the Pacific Southwest Forest and Range Experiment Station have stated that the wide range of soil conditions resulting from various mudflows whose chronology is a matter of record and the shrub and tree vegetation that has developed on these soils provide a unique, rich area for ecological studies.

B. Efforts to Protect the Area

The uniqueness of the research area, the international acclaim accorded to the results of investigations, and the prospect of additional knowledge led to efforts to preserve the area in its present form. G. L. Collins, then President of The Nature Conservancy, led the first attempt to preserve the area in 1964, but there was considerable question as to how large an area was needed to sustain natural conditions. Dr. Hans Jenny, Professor Emeritus, Department of Soils and Plant Nutrition, University of California, has continued the efforts towards classification of the area and in September 1969 developed a clearer definition of the research needs. Meetings were held in the Regional Office and on the site and an impact report was prepared by staff of the Shasta-Trinity National Forest. The following report reflects the results of contributions from many sources.

II. GENERAL INFORMATION

A. Name

Shasta Mudflow Research Natural Area.

Looking in a northwesterly direction from the southeast corner of the Shasta Mudflow Research Natural Area. The photo point is the intersection of Mud Creek and Forest Service road 42N13.9. In the foreground is Mud Creek and portions of the A flow.



Shasta Mudflow
Research Natural Area

National Forests IN CALIFORNIA



CALIFORNIA REGION HEADQUARTERS

U. S. Forest Service
630 Sansome Street
San Francisco, CA 94111

NATIONAL FOREST HEADQUARTERS

Angeles National Forest
1015 No. Lake Avenue
Pasadena, CA 91104

Cleveland National Forest
3211 5th Avenue
San Diego, CA 92103

Eldorado National Forest
100 Forni Road
Placerville, CA 95667

Inyo National Forest
2957 Birch Street
Bishop, CA 93514

Klamath National Forest
1215 So. Main Street
Yreka, CA 96097

Lassen National Forest
707 Nevada Street
Susanville, CA 96130

Los Padres National Forest
42 Aero Camino
Goleta, CA 93017

Mendocino National Forest
420 E. Laurel Street
Willows, CA 95988

Modoc National Forest
441 No. Main Street
Alturas, CA 96101

Plumas National Forest
159 Lawrence Street
Quincy, CA 95971

San Bernardino
National Forest
144 North Mountain View
San Bernardino, CA 92408

Sequoia National Forest
900 W. Grand Avenue
Porterville, CA 93257

Shasta-Trinity
National Forests
1615 Continental Street
Redding, CA 96001

Sierra National Forest
1130 "O" Street
Fresno, CA 93721

Six Rivers National Forest
710 "E" Street
Eureka, CA 95501

Stanislaus National Forest
175 So. Fairview Lane
Sonora, CA 95370

Tahoe National Forest
Highway 49 & Coyote St.
Nevada City, CA 95959

INTERMOUNTAIN REGION

Toiyabe National Forest
Main Post Office Building
Reno, Nevada 89504





Conservation Pledge

I GIVE MY
PLEDGE AS AN AMERICAN
TO SAVE AND FAITHFULLY TO
DEFEND FROM WASTE THE
NATURAL RESOURCES OF
MY COUNTRY — ITS SOIL
AND MINERALS, ITS
FORESTS, WATERS,
AND WILDLIFE

Maps covering one National Forest are sent free of charge. Additional maps may be obtained at a minimum cost of 15 cents per National Forest.

If you wish maps of more than one National Forest, please send a check or money order made payable to: U. S. Forest Service, USDA. The price of a complete set of maps for the National Forests in California is \$2.55. Please allow at least two weeks delivery time.

Send your request to the U. S. Forest Service, Division of I&E, 630 Sansome Street, San Francisco, California 94111.

B. Location

On the southeast slopes of Mt. Shasta, McCloud District, Shasta-Trinity National Forest between Konwakiton Glacier and the McCloud Railroad tracks east of the town of McCloud, California. The total area includes parts of T40N R2W, T41N R2W, and T41N R3W., M.D.M.

C. Size

Approximately 3,467 acres are in this proposed Research Natural Area.

D. Boundaries

The boundaries are either natural terrain features or cardinal directions connecting standard points along section lines or within sections. The northeastern, southeastern, and southern boundaries are considered significant and were selected with care. The western boundary was selected in order to accommodate the ownership patterns of the area. It is generally agreed that the area is the minimum size which will allow the natural processes to continue on a scientifically significant scale.

The metes and bounds description is as follows:

Starting at Mud Creek Dam on the section line between Sections 5 and 8, T40N R2W, the boundary runs southeasterly along a line 200 feet northeast horizontal distance from the northeast streambank of Mud Creek until it intersects the southern section line of Section 8,

Thence in an easterly direction to the southeast section corner of Section 8,

Thence in a southerly direction along the section line to the northwest corner of the SW 1/4 of the NW 1/4 of Section 16,

Thence in an easterly direction to the northeast corner of the SW 1/4 of the NW 1/4 of Section 16,

Thence in a southerly direction to the southeast corner of the SW 1/4 of the NW 1/4 of Section 16,

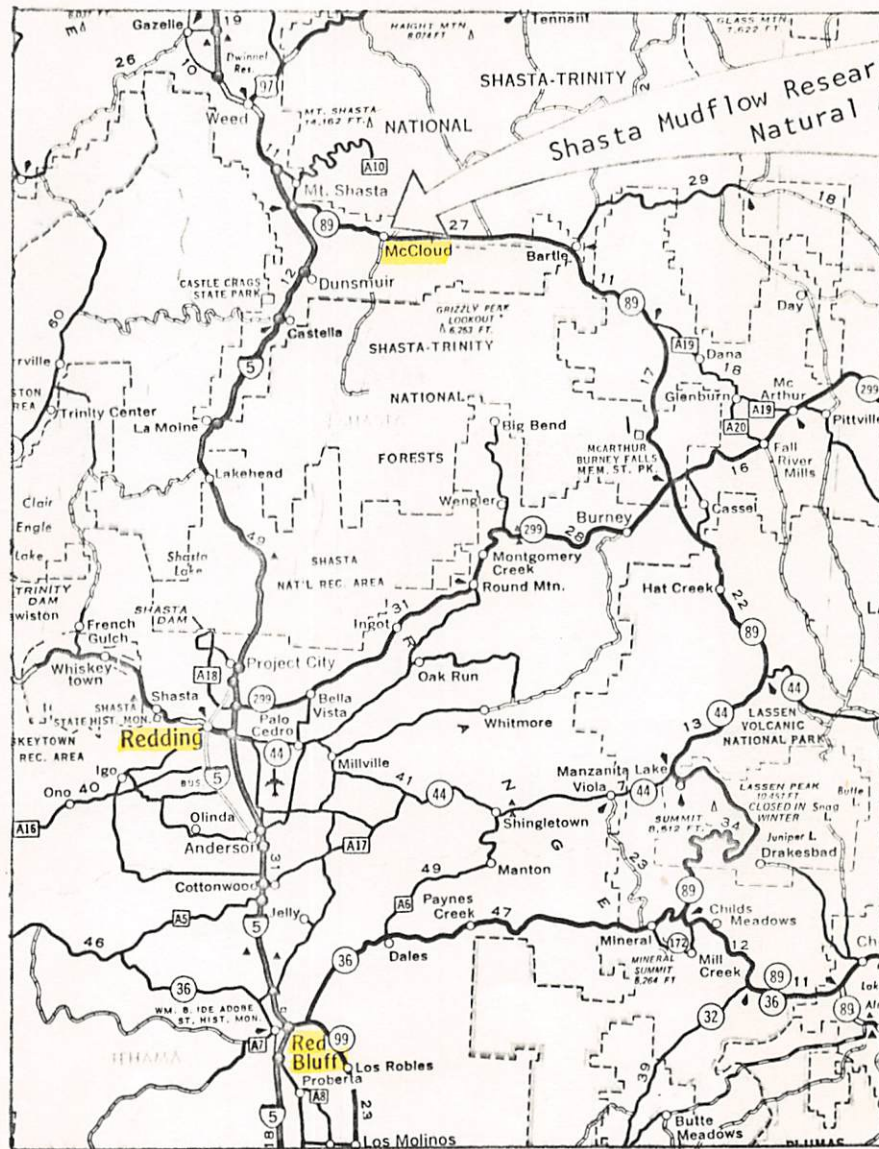
Thence in an easterly direction to the center of Section 16,

Thence in a southerly direction to a point 200 feet horizontal distance northeast of the outer edge of the streambank of Mud Creek,

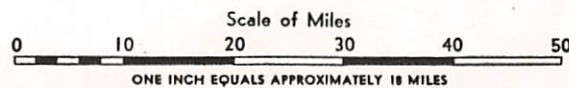
Thence southeasterly along a line 200 feet northeast horizontal distance from the northeast streambank of Mud Creek until this boundary intersects Forest Service road 42N13.9 at a point in the NE 1/4 of Section 27,

VICINITY MAP

Shasta Mudflow Research Natural Area



North



Thence southwesterly along road 42N13.9 until it intersects road 40N56.6 at a point in the SW 1/4 of Section 27,

Thence southerly along road 42N13.9 until it intersects road 40N14.6 at a point in the NW 1/4 of Section 34,

Thence westerly along the National Forest boundary to the center of Section 32,

Thence in a northerly direction to the 1/4 section corner between Sections 20 and 29,

Thence in an easterly direction to the southwest corner of the SE 1/4 of the SE 1/4 of Section 20,

Thence northerly along the National Forest boundary to the southwest corner of the SE 1/4 of the NE 1/4 of Section 17,

Thence in a westerly direction to the center of Section 17,

Thence in a northerly direction to the 1/4 section corner between Sections 8 and 17,

Thence westerly along the National Forest boundary to the southwest corner of Section 8,

Thence northerly along the National Forest boundary until it intersects road 41N31.1 at a point on the west edge of the NW 1/4 of Section 8,

Thence northeasterly along road 41N31.1 until it intersects the starting point at Mud Creek Dam.

III. LAND OWNERSHIP

The proposed area is mostly National Forest land. Only 280 acres within the proposed boundary are private land. Kimberly-Clark Corporation owns 120 acres in Section 17, and U.S. Plywood Corporation owns 160 acres in parts of three other sections. Both companies are oriented to management of their timber resources for sustained production of sawlogs for their mills. There are no current plans for company logging in the proposed natural area. Both Companies are large landholders, and it is possible they would recognize the scientific value of this small acreage and dedicate the use of these areas to scientific pursuit.

Map Showing Boundary Lines of the
SHASTA MUD FLOW RESEARCH NATURAL AREA

Boundary Line
Private Land

Scale: 2 inches = 1 mile

North

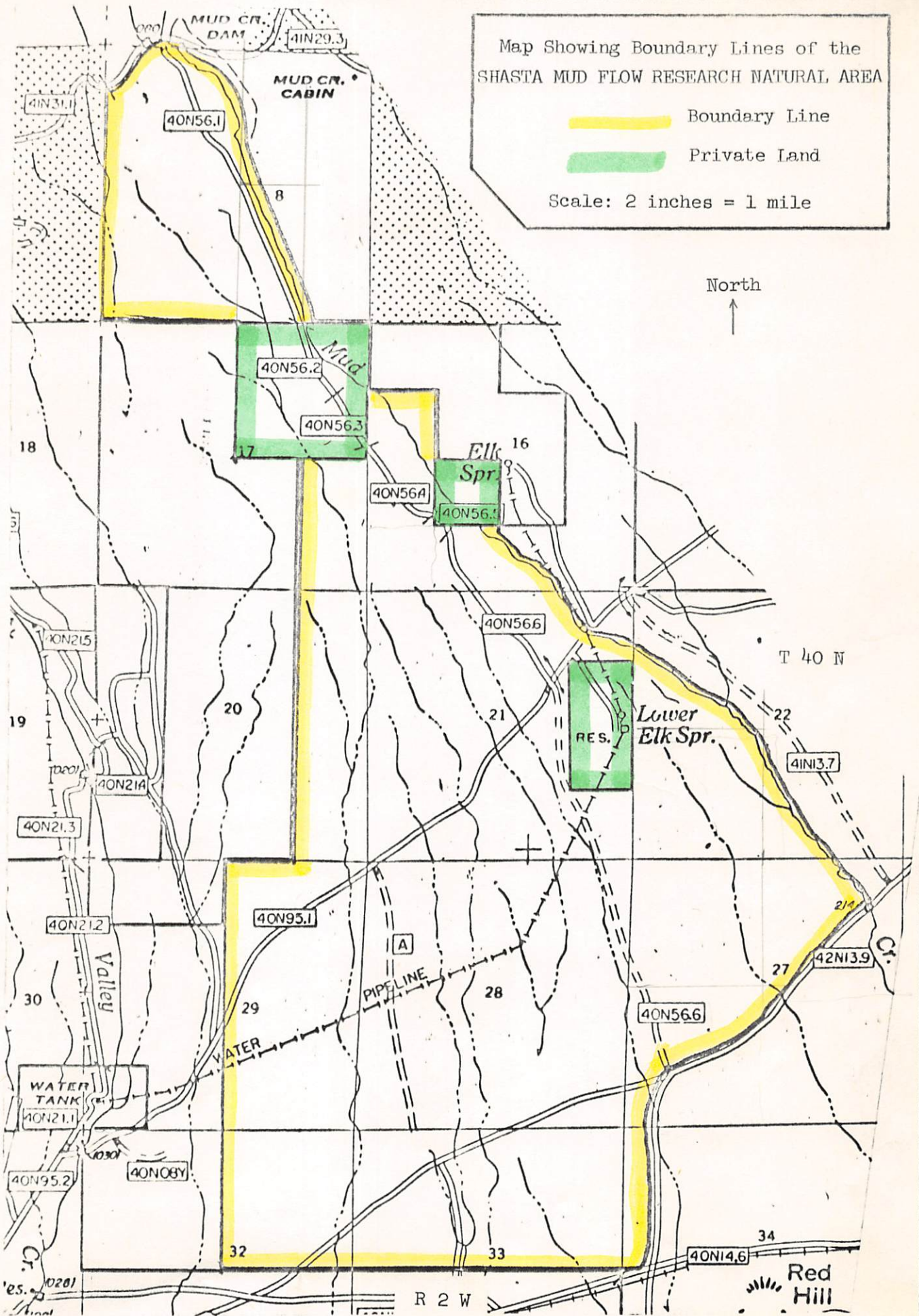
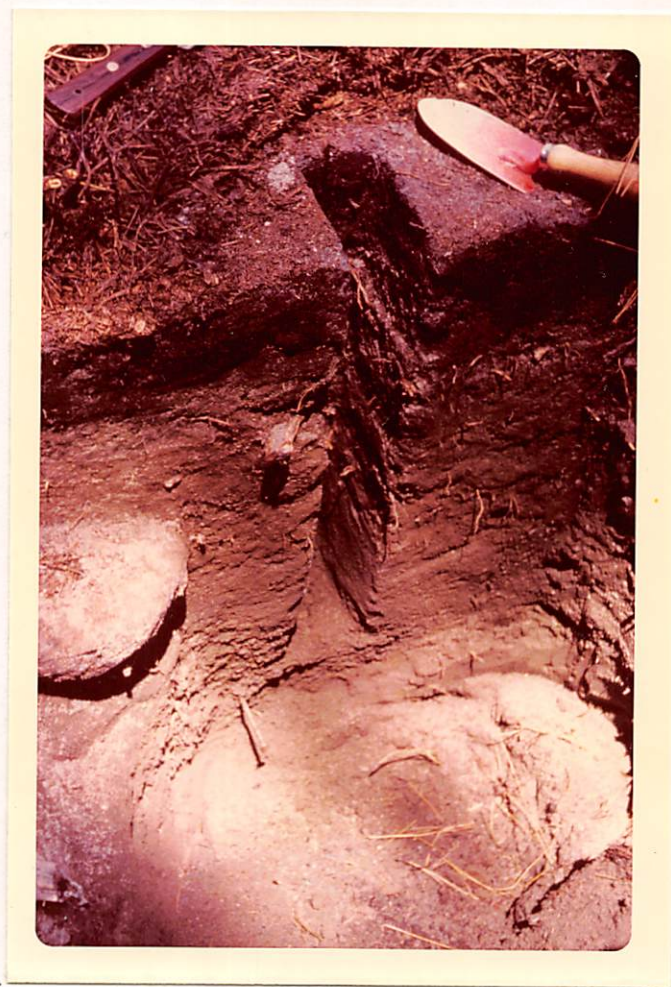


Table 1.--Area by ownership within proposed Research Natural Area
(T14ON R2W).

Section	National Forest	Kimberly Clark	U.S. Plywood	Total
----- acres -----				
8	410	--	--	410
16	202	--	40	242
17	80	120	40	240
20	160	--	--	160
21	539	--	80	619
22	228	--	--	228
26	25	--	--	25
27	345	--	--	345
28	640	--	--	640
29	320	--	--	320
32	160	--	--	160
33	320	--	--	320
34	38	--	--	38
Total	3,467	120	160	3,747



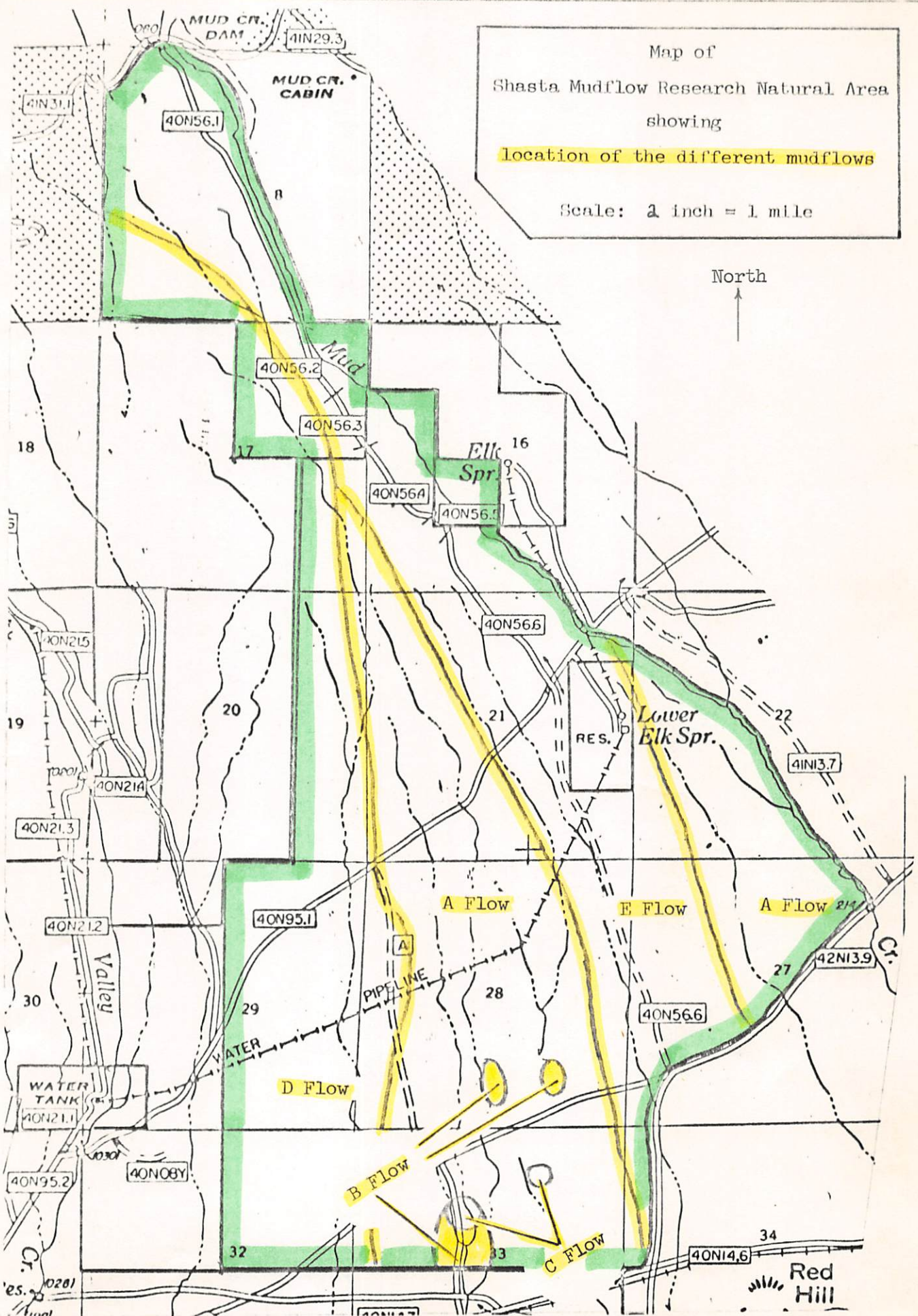
Whitish mud material of A-Flow of 1924 resting on buried E-Flow. Note the roots sticking out. The rich E-Flow was once as undeveloped as whitish overburden of A-Flow.



This soil profile on the 300-year-old B-Flow was once a uniformly whitish color throughout the profile.

Scale: 2 inch = 1 mile

1



IV. RESOURCE INVENTORY

A. Research Importance

A stratigraphic sequence of mudflow deposits resulting from rapid melting of ice and snow covers the area. Mud Creek, originating at the face of Konwakiton Glacier, has cut deeply into this material. At least five major mudflows separated by substantial periods of years have been associated with Mud Creek.

The most recent flow occurred in 1924 resulting from a mild winter in 1923, an early spring in 1924, and an extremely hot summer which produced heavy melting of the glacier. Excessive water accumulated behind small natural dams in the canyon where slides and debris had filled the natural channel. As pressures grew, the whole mass of water and volcanic material flowed down as a mixture of mud the consistency of concrete. Flow B has been carbon dated at about 300 years old.

The other three flows recognized so far can also be dated. The oldest is tentatively dated at 1,200 years, perhaps even older. This dated age sequence gives the area its great value for scientific and educational purposes.

The "source area" of the mudflows is not part of this proposed Research Natural Area, but the District multiple use management plan recognizes its importance as part of the total picture of the situation. (District management units S-6 and GF-8 are discussed in Appendix A.)

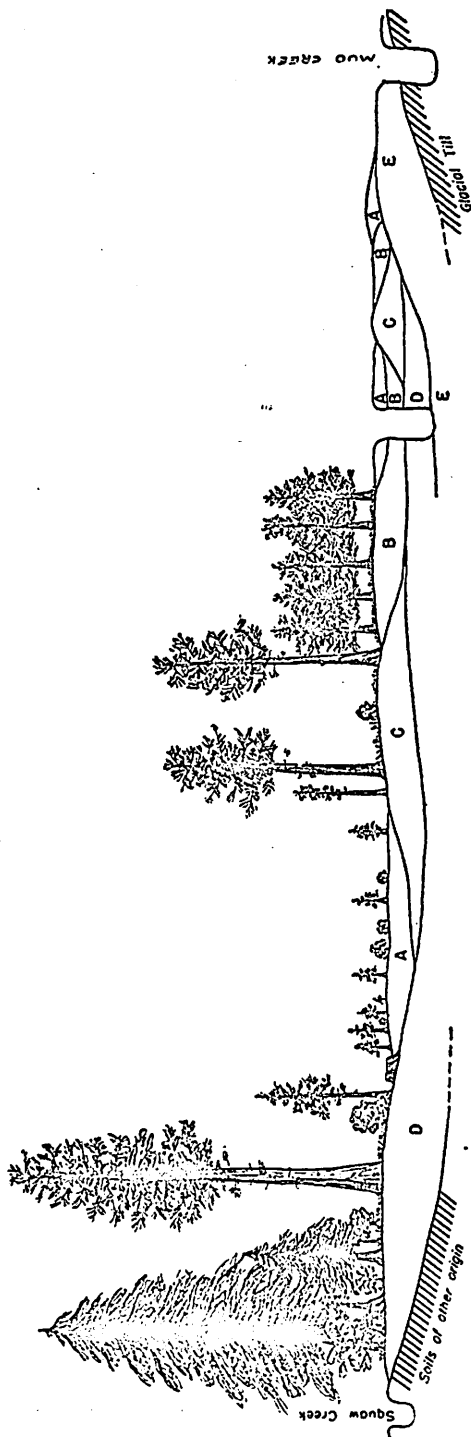
Each mudflow consists of coarse sand, essentially pulverized rock of andesitic composition, unmodified by previous soil forming processes. It is because of this uniform and homogeneous parent material that the area is so desired by the soil scientists for research purposes.

The situation is summarized as follows:

1. There has been very little disturbance by man since the area was logged in the late 1920's.
2. The area offers a visible record of post-Pleistocene history. These dated mudflows can be used to study the genesis of soil profiles and the relationship to the forest ecosystem associated with the profile.
3. All flows have similar state factors, namely, similar aspects, similar slope configurations, and--what is highly important--similar parent material.
4. The area contains several stages in the life history of a ponderosa pine forest.

Table 2.--Mudflow deposition areas below dam on National Forest
land within proposed Research Natural Area boundary.
Approximate acreages of the five flows according to
sections (T40N R2W MDB&M).

Section	Flows					Total
	A	B	C	D	E	
	- - - - - acres - - - - -					
8				24	386	410
16	38				164	202
17	24			56		80
20	4			156		160
21	243				296	539
22	160				68	228
26	13				12	25
27	89				256	345
28	339	32		90	179	640
29				320		320
32				160		160
33	261	36	10	13		320
34	13				25	38
Total	1,184	68	10	819	1,386	3,467



Diagrammatic Section of the Mud Flow Area
Showing Stratigraphic Relationships, Buried Soils,
and the Vegetation

Mud Flow Ages	
A	27 years
B	60 "
C	205 "
D	566 "
E	1200+ "

(From "A Chronosequence of Soils and Vegetation near Mt. Shasta, California." B.A. Dickson and R.L. Crocker, Journal of Soil Science Vol 4 No. 2 1953)

Since 1957 scientists from the Pacific Southwest Forest and Range Experiment Station have been carrying out extensive studies on the population dynamics of western pine beetle (Dendroctonus brevicornis Lec.) in the Mt. Shasta area. A portion of the Research Natural Area (Sections 22, 27, and 34) is included in the insect survey area. The Research Natural Area will serve as a valuable benchmark to judge the effectiveness of any future studies in the surrounding area on bark beetle control.

Scientists from the University of California have expressed interest for including this area in the International Biological Program Coniferous Biome project.

B. Minerals

U.S. Plywood Corporation has a 5-year Mineral Material Permit for sand just west of Mud Creek in the NE 1/4 of the NE 1/4, Section 27, T40N R2W. Expiration date of the permit is 4/24/75. Estimated volume removal is 1,100 cubic yards per year. The permit area is at the east edge of the proposed natural area boundary. It is recommended the permit be allowed to continue until expiration and then a new source be made available, if requested, from a source south of the area boundary.

No valuable minerals are known to exist in the area and there is no history of mineral activity.

C. Recreation Situation

No inventoried, planned, or existing recreation development sites lie within the proposed boundary. No recreation attractions such as water for fishing are included in the area. The area receives some use by deer hunters, but this is insignificant compared to the number of hunter days in the adjacent McCloud Flats.

D. Timber

The total area is either timbered or is a potential timber growing site. The National Forest land south of Section 8, T40N R2W, was acquired from the McCloud River Lumber Company via land exchange in 1932. These timber stands were heavily logged prior to the exchange. Overstory volume is light, but most of the area is heavily stocked with poles and young mixed conifer sawtimber.

The 22-MM-board-foot Signal Sale scheduled for October 1974 includes some 6 MM board feet from within the proposed natural area boundary. Establishment of this Research Natural Area will take about 3,467 acres of the District's 207,954 acres of commercial forest land out of production. This will reduce the District's annual harvest by about 1/60 of its present level of 42.5 MM board feet per year for the planning period 1970-1980.

E. Forage

The proposed natural area includes 2,290 acres of the McCloud Sheep and Goat Allotment. This land is mostly stocked with young timber with old-growth overstory and has not been used by sheep for several years because of the light feed and because more than adequate feed of preferred species is available on the southern portion of the allotment.

The initial proposed boundary was shifted from Mud Creek and the railroad tracks on the south to the Pilgrim Creek Road in order to eliminate 16 acres of meadow type feed, a primary stock watering source, and sheep loading corrals from the proposed natural area. As a result, impacts on the forage and allotment are negligible.

F. Wildlife

Deer and doves can be found in this area. Classification will not affect wildlife numbers or movement into or out of the area.

G. Fisheries

None. Mud Creek does not carry a fishery or fishery potential because of heavy sediment conditions.

H. Water

The area is flat with no well-defined drainage except for Mud Creek along the eastern boundary. Because Mud Creek carries sediment of varying intensities the year around, the water is not used by stock or for other purposes. The flow in late summer gets down to 3 or 4 c.f.s. along the area boundary.

From 1927 to 1933, sport fishing interests on the McCloud River, into which Mud Creek flows, financed a costly project to settle out the sediment from Mud Creek in huge basins. The basins filled so rapidly that the method was given up because of the expense. In 1934 the Forest Service financed a large diversion dam, settling basin, and canal to remove most of the sand and divert the water onto the flat area east of Mud Creek, where it would sink into the porous pumice type soils and lose the fine silt load. The structures were not adequate in high water, and the dam is now full of sediment.

V. OTHER IMPORTANT CONSIDERATIONS

A. Pipeline Easement

Elk Springs, located on U.S. Plywood land just east of the natural area boundary in Section 16, is one of McCloud community's water sources. The water is piped through Sections 21, 28, and 29 of the proposed natural area. The pipeline is shown on the attached map.

With the exception of the 80 acres in the E 1/2 of Section 21, the entire pipeline within the area boundary is on National Forest land. Right-of-way across National Forest land was reserved by McCloud River Lumber Company in the 1932 land exchange. The McCloud River Lumber Company has since been acquired by U.S. Plywood. The Company reserved the right to use, maintain, operate, reconstruct, and repair the present pipeline or conduit for the conveyance of water on the same or new location.

The pipeline is old and no doubt will need to be replaced and possibly relocated in certain areas in the future. Any relocation and/or replacing of the pipeline will require soil disturbance to some degree and could have adverse effect on the natural area. Any adverse effect could be minimized by staying in the present location since it has already been disturbed at least once.

B. Fire Control

Fire risk is low because of limited human use of this area. Hazard is medium. All of the area has less than 20 percent slopes except the banks of Mud Creek. Most of the area is readily accessible via an existing low standard road system. A fire station is within 15 minutes' travel time of the area.

C. Insects and Diseases

The area is not a problem area from this standpoint. Any existing situation is endemic.

D. Transportation System

The existing transportation system consists of several very low standard dirt roads (all SL 10) as shown on the map. Plans and surveys have been made for higher standard logging roads in connection with the Signal Timber Sale scheduled for 1974 (see item IV-D). Topography outside the area is such that alternate routes are possible through adjacent private land. Rights-of-way may be needed.

A few routed standard Forest Service directional signs are at the road junctions.

VI. ANALYSIS OF THE OVERALL SITUATION

A. General

This area has outstanding value for scientific research. The natural ecological processes should be protected, as far as possible, against unnatural (man-caused) modification. Once suitable adjustments are made in the plans for the Signal Sale, designation as a research natural area will be compatible with the multiple use plans for the Shasta-Trinity National Forest.

B. Modified Conditions of This Site

In the strictest sense a research natural area should have no roads or trails. But in a practical sense such areas cannot always be found. In these times of competing land uses many research natural areas will be compromises between the ideal and the actual. In this case, sufficient justification exists for establishing a research natural area in spite of the presence of a dirt road and use by hunters (FSM 4063.1, para. 3). In the case of the road, it is of such poor quality (SL 10) that few people use it. There are no developed stopping off points (e.g., campgrounds, picnic areas, etc.) to attract public use. The area is large enough (3,747 acres) to absorb, or buffer, disturbance caused by present use of the road. In the case of hunting, FSM 4063.46 recognizes hunting as an acceptable use of research natural areas when done at a scale not sufficient to affect the biotic communities.

VII. ADMINISTRATION AND PROTECTION

A. Management Direction

The Forest Service will protect the area against activities which directly modify natural ecological processes and will preserve the unique mudflows, soils, vegetation, and other environmental values for educational use and for purposes of scientific research. Use by responsible scientists and educators will be encouraged.

B. Management Decisions

1. Timber Management plans for the Signal Sale will be amended to exclude commercial timber sales from the proposed Research Natural Area.

2. Management plans will continue to recognize the scientific importance of the "source area" (General Forest Management Unit GF-8, Special Zone Management Unit S-6) upstream from the proposed area and to safeguard against practices that would cause its scientific value to deteriorate.

3. The Shasta-Trinity land acquisition plan will be amended to provide for acquisition of the private holdings within the boundaries of the Research Natural Area and to allow for acquisition of the private holdings in the source area.

4. The Research Natural Area will be withdrawn from mineral entry.

5. No new roads will be constructed in the Research Natural Area and the existing roads will not be upgraded or improved.

6. Current use by hunters is recognized, but increased hunting pressure will not be encouraged. At some future date it may be necessary to evaluate the impact of hunting on the scientific values.

7. No grazing will be allowed in the Research Natural Area.

8. Good judgment must be used involving repair or replacement of the pipeline. In cases involving major disturbance, advice should be sought from knowledgeable scientists.

9. The existing mineral materials permit in T4ON R2W NE 1/4 NE 1/4, Section 27, will be allowed to continue to expiration date on April 24, 1975, but will not be renewed.

C. Fire Protection

Fires within this Research Natural Area will be extinguished as quickly as possible, but no cleanup, fire hazard reduction, or reforestation will be undertaken (FSM 4063.45).

D. Protection from Future Mudflows

In the event a mudflow should again threaten life and property values in the town of McCloud, appropriate action may be taken in the interest of public safety, but to the maximum extent possible such mudflow shall be allowed to play its normal role in the ecology of the reserve.

E. Administrative Responsibilities

The scientific and educational uses made of this Research Natural Area by Forest Service and other scientists is a research responsibility administered by the Director of the Pacific Southwest Forest and Range Experiment Station. Protection is a Shasta-Trinity National Forest responsibility (FSM 4063.2).

VIII. RECOMMENDATION

We recommend that the Shasta Mudflow Research Natural Area be established on the lands described in this report.

Submitted:

John C. Merwin
Multiple Use Impact Survey Officer,
Shasta-Trinity National Forest

6 July 71
(Date)

Norm H. Chastko
Assistant Director's Staff, Pacific
Southwest Experiment Station

28 Jun 71
(Date)

Recommended:

Paul Statham
Forest Supervisor, Shasta-Trinity
National Forest

July 7, 1971
(Date)

Douglas Leisz
Regional Forester, Region 5

8/19/71
(Date)

Robert D. McCreary
Director, Pacific Southwest Experiment
Station

8/25/71
(Date)

Approved:

Hubert C. Stoney
acting Deputy Chief, Research

10/8/71
(Date)

Alan Lamb
Acting Director, Division of Recreation

10/7/71
(Date)

REFERENCES

- Beardsley, G. F., and Cannon, W. A. 1930. Note on the effects of mudflow at Mt. Shasta on the vegetation. *Ecology* 11: 326-336.
- Cooke, W. B. 1940. Flora of Mt. Shasta. *Amer. Midl. Nat.* 31: 497-572.
- Dickson, B. A., and Crocker, R. L. 1953, 1954. A chronosequence of soil and vegetation near Mt. Shasta, California. *Jour. Soil Sci.* 4: 123-140, 144-154; 5: 173-191.
- Glauser, R. 1967. The ecosystem approach to the study of the Mt. Shasta Mudflows. Ph.D. Thesis, University of California, Berkeley. 288 p.
- Williams, H. 1932. Mount Shasta, a Cascade volcano. *Jour. Geol.* 40: 417-442.

McCLOUD DISTRICT MULTIPLE USE PLAN

(July 1, 1969)

Extracts Covering the "Source Data"

GF-8 MUD CREEK EROSION UNIT

DESCRIPTION

This unit encompasses the area upstream on Mud Creek from the Mud Flow Soils Exclusion Unit (GF-3) to the boundary of the Mt. Shasta Special Zone. The unit straddles Mud Creek and the upper portions of the recent mudflows. The area is characterized by highly erosive streambanks that are continually sloughing in during periods of high water keeping streambanks raw. Lava ash and glacial silt and flour are carried to the McCloud River the year around. This unit borders the S-6 unit in the Mt. Shasta Special Zone and is synonymous with it.

MANAGEMENT DECISIONS

1. Heavy equipment will not be permitted within 200 feet of streambank edges except at designated stream crossings.
2. Harvest of timber will be limited to those trees that can be felled away from the streambanks. No trees, logs, tops, or slash will be permitted to fall on or across the upper edges of streambanks or in the stream channel.
3. Certain other areas outside the stream course may be designated for complete exclusion except for scientific study and V.I.S. activities.

S-6 MUD CREEK EROSION UNIT

DESCRIPTION

This unit encompasses the Mud Creek Drainage from the south edge of the Mt. Shasta Special Zone up to and including Konwakiton Glacier, the source of Mud Creek. The southern end of this unit adjoins Unit GF-8 and is synonymous with it.

MANAGEMENT DECISIONS

1. Same as GF-8.
2. Same as GF-8.
3. Same as GF-8.



DEPARTMENT OF SOILS AND PLANT NUTRITION

HILGARD HALL
BERKELEY, CALIFORNIA 94720

April 23, 1971

Mr. Robert D. McCulley, Director
Pacific Southwest Forest and Range
Experiment Station
P.O. Box 245
Berkeley, California 94701

Dear Mr. McCulley:

Through the kindness of Mr. Norden H. Cheatham, I have been informed that a portion of the ecologically unique Mt. Shasta mudflow area near the town of McCloud, California, is to be preserved as a research natural area.

May I say that this is a marvelously exhilarating and gratifying piece of news to me personally. For California, the nation and, yes, the world, it is an important ecosystem tessera as it were, in the mosaic of the earth's natural preserves, the rightful natural scientific legacy we leave our children.

During the many years of my active research of the soil-plant-ecosystems on the mudflows (1958-1965), affiliated first with the late Dr. R. L. Crocker, its discoverer as a potential site for the study of soil chronosequences and plant succession studies (Dickson and Crocker 1953, Jour. Soil Sci.) and later with Dr. H. Jenny, under whom I completed my Ph.D. work on the area, U. C. in the Department of Soils and Plant Nutrition, and my continued interest now in preparing manuscripts and giving seminars on this work, make me fully aware of the important scientific potential of this mudflow area, its uniqueness and the importance of its being preserved as an undisturbed natural area for present and future ecosystem research.

Accurately dated, stable, relatively mineralogically homogeneous soil bodies are not easy to come by and a search of the world's literature on the subject bears out this point. We have here in effect an outdoor laboratory where the important parameter time can be assessed as a factor in soil formation. Equally important, the biologic impact of plants and animals can be assessed on their effect on soil formation, especially during the early revegetation cycles. Among the plants the commercially important Pinus ponderosa and the game browse species Purshia tridentata are very prominent, the former at all ages on all mudflows, the latter primarily on the youngest flow.

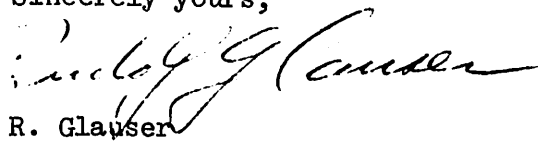
Mr. Robert D. McCulley
Page 2.
April 23, 1971

Also the area's proximity to yet another natural area already preserved, namely Lassen National Park, where some dated dacite mudflows as contrasted to the Shasta andesite flows occur is important. This significantly expends the possibilities of studying chrono and biosequences of the volcanic mud-flow type where climatic, mineralogic and biotic parameters differ.

Early affiliation (1963-1965) with foresighted groups aware of the Mt. Shasta mudflow area's scientific potential and the importance of its preservation in its natural condition, has made this Comprehensive Designation Order entitled Shasta Mudflow Research Natural Area, a source of deep personal satisfaction and cause to express gratitude to all those instrumental in bringing the project to this point. So many times there seemed insurmountable obstacles to overcome and the area whittled to scientific insignificance.

Permit me to add my voice to urge you to continue to take the necessary steps in bringing this project to fruition as the Designation Order, Shasta Mudflow Research Natural Area, so succinctly, accurately and comprehensively presents.

Sincerely yours,



R. Glauser

Department of Soils and Plant Nutrition
University of California, Berkeley

RG:sjb

CALIFORNIA STATE POLYTECHNIC COLLEGE

SAN LUIS OBISPO, CALIFORNIA 93401

AGRICULTURE

APPLIED ARTS

APPLIED SCIENCES

ARCHITECTURE

ENGINEERING

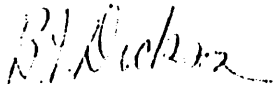
April 21, 1971

Dr. Donald W. Lynch, Assistant Director
Pacific Southwest Forest and Range
Experiment Station
P.O. Box 245
Berkeley, California 94701

Dear Dr. Lynch:

I was both pleased and slightly astonished to receive a copy of the Shasta Mudflow establishment report. I was not aware that this project had developed to this point. I have studied it carefully in the light of my knowledge of the area, and consider it to be an entirely reasonable and useful proposal. If the land owners and other local persons see no objection, I'm sure that I cannot.

Yours truly,



B. A. Dickson
Professor
Soil Science Department

P.S. I am enclosing copies of the original research done in this area, in case it might be of use to you.

Encls.



SOIL
CONSERVATION
SOCIETY
OF AMERICA

CHAPTER CORRESPONDENCE
Address reply to:

3310 Bechelli Lane
Redding, California 96001

June 21, 1971

Jesse Newlun
Chas. Klaseen

Mr. Robert D. McCulley, Director
Pacific Southwest Forest and Range Experiment Station
P. O. Box 245
Berkeley, California 94701

Dear Mr. McCulley:

The Shasta-Lassen Section, California Chapter of the Soil Conservation Society of America endorses the establishment of the proposed Shasta Mudflow Natural Research Area at the earliest possible date.

The use of this area as a laboratory for the study of soils, geomorphology, and forest ecosystems should prove invaluable to the life and earth sciences.

The number of mudflows in this one small area provides an excellent opportunity for the study of soil development, landscape genesis, and the development of forest ecosystems. From the standpoint of soils alone, the channel eroded into the mudflows by the waters of Mud Creek, provide a nearly vertical cross-section of the history of the earth movements and periods of soil development. The geomorphologic processes that form the landscapes are easily observed and studied in the channel banks. Stone lines, strata colors, soil profiles, old and new, are strikingly and colorfully displayed.

The processes of erosion, by wind, of the very softly consolidated mudflow debris can also be observed and studied. Wind erosion has undoubtedly contributed to landscape formation as it does today.

There are many differences in the vegetative composition due to soil textures, soil age, and the amounts of coarse fragments within the soil.

There are excellent displays in the banks of the creek channel of root matting and penetration into cracks of the mudflow deposits.

Further delay in the establishment of this as a research area will only decrease its value for study. There is some active deterioration of the environment taking place at present. Logging around the area and grazing within are the chief causes of deterioration. Wind and water erosion of the Mud Creek channel banks is altering their appearance rapidly and they should be under study now.

Sincerely,

Jesse Newlun
Ted Klaseen

Jesse Newlun
Ted Klaseen

cc: Leonard Wohletz

STANFORD UNIVERSITY
STANFORD, CALIFORNIA 94305

DEPARTMENT OF BIOLOGICAL SCIENCES

April 30, 1971

Mr. W. V. Jones
Acting Forest Supervisor
Shasta-Trinity National Forest
1615 Continental Street
Redding, California 96001

Dear Mr. Jones:

I read with interest the description of the Mt. Shasta Mud Flow region. I certainly concur entirely with the statements made in the news release of February 24, 1971, regarding this area. It is true that a series of different aged land surfaces in one area is a rather rare occurrence. It is also true that such a group of surfaces all occurring within a single climatic type are essential for the study of soil development and plant succession. Further, it is also true that the use of such important areas for long-term studies is dependent on the rigid protection of the area. I would certainly argue for the prime use of this area as a research natural area.

Sincerely yours,

Harold Mooney

Harold Mooney
Associate Professor

HM:gm