

SAFETY ELEMENT

INTRODUCTION

Government Code Section 65302(g) requires the adoption of a Safety Element

for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability..., mudslides and landslides, subsidence and other geologic hazards...; flooding, and wildland and urban fires. The safety element shall include mapping of known seismic and other geologic hazards. It shall also address evacuation routes, peakload water supply requirements, and minimum road widths and clearances around structures as those items relate to identified fire and geologic hazards.

The Government Code allows cities to adopt a county' safety element provided that it is "sufficiently detailed and contains appropriate policies and programs".

GOALS

- I) Protection of the residents of the City of Weed from naturally and human caused accidents or hazards.
- II) Protection of the property within the Weed planning area from naturally and human caused accidents or hazards.
- III) Protection for future residents and property located in the Weed planning area from naturally or human caused hazards.

POLICIES/IMPLEMENTATION MEASURES

As noted above, Weed may adopt appropriate components of the Siskiyou County Safety Element(SCSE). SCSE policies are so noted.

A) Geologic and structural hazard information relating to private development should be readily available. (SCSE).

IMPLEMENTATION MEASURE: City shall make available to the public information regarding geologic, fire, and other potential hazards that are or may be present in the planning area. In particular, information to homeowners regarding fire safety practices should be provided to all potential homebuilders.

B) All public buildings should be reviewed for structural adequacy and the ability to withstand possible earthquakes and ground shaking. Emergency services buildings including police and fire buildings and schools should be evaluated. (SCSE).

IMPLEMENTATION MEASURE: City shall catalog public buildings according to their capacity to withstand possible earthquakes and ground shaking. City shall enact measures designed to protect emergency services such as fire, police, and communication in the event of a major seismic event.

C) City emergency services shall be provided with appropriate plans, policies, and resources to contain urban fires.

IMPLEMENTATION MEASURE: City shall evaluate the fire and police department plans and/or policies to ensure that they are up to date and sufficient to contain urban fires. Fire Department procedures should specifically be evaluated.

D) City water system shall be evaluated to ensure that adequate water service is available to contain large fires.

IMPLEMENTATION MEASURE: City shall catalog areas in need of additional or new fire hydrants and areas with difficult access by fire protection equipment.

E) Existing and proposed land use development proposals should be reviewed as to fire safety.

IMPLEMENTATION MEASURE: City should enact standards regarding clearances around structures and fire hazards on developed and vacant land parcels to limit the potential for fires. Appropriate road width standards shall be implemented to ensure access by emergency equipment to all areas in the City.

F) The potential for and emergency services response to toxic or hazardous materials spills on the highway and railroad should be evaluated.

IMPLEMENTATION MEASURE: City shall evaluate existing response plans to ensure that emergency services resources are adequate to cope with a toxic or hazardous material accident. If current plans are inadequate, emergency response plans shall be developed to meet any possible emergency situation. Appropriate training programs shall be implemented.

G) Emergency response plans should be adequate to meet conditions expected in a "worst case" emergency scenario.

IMPLEMENTATION MEASURE: City shall evaluate evacuation plans to ensure safe, prompt, and orderly evacuation of all City residents. City shall coordinate evacuation plans with other local and state agencies.

H) City zoning and building ordinances shall be reviewed to ensure adequate protection from safety hazards.

IMPLEMENTATION MEASURE: City shall develop overlay zoning for flood, landslide, and wildland fire hazard zones in the City.

DESCRIPTION OF THE PLANNING AREA

GEOLOGY AND TOPOGRAPHY:

The Weed planning area is located near the border of two major northern California geologic provinces: the Klamath Mountains Province and the Cascade Mountain Range Province. However, the majority, if not all, of the planning area is located in the Cascade Mountain Range Province. The Cascade Mountain Range Province is more closely related geologically to the Modoc Plateau Province to the east rather than the Klamath Mountain Province to the west.

The planning area is located at the north end of Shasta Valley, a north-south trending trough between the Klamath Mountains to the west and the Cascade Mountains to the east. The Shasta Valley floor generally contains volcanic rocks of Cenozoic origin.

Spectacular geomorphic features surround the Weed planning area: Mt Shasta (14,162 feet) and Shastina mountain (12,330 feet) to the east; Black Butte (8,825) to the south; Mt Eddy (9,038 feet) to the southwest; and, large black lava flows to the northeast. None of these spectacular features is located within the boundary of planning area. However, the volcanic history of the area is evident in the soils, rocks, and terrain of the planning area.

Appendix 2 contains a generalized illustration of the geology and geologic features of the region.

The topography of the planning area varies with the urbanized area relatively flat to gently undulating with scattered hills that are less than 300 feet in height. Two hilly areas are located in the middle of the planning area ("schoolhouse hill" and the hill near the Shastina Golf Inn), another is located in the north part of the planning area (near Lincoln Heights), and the last is located in the southwest part of the planning area ("watertank hill"). The urbanized area is not as flat as the Sacramento Valley but is relatively flat when compared to the surrounding region.

Slopes on the hills can be steep and areas of potential landslide hazard are located on the slopes of the few hills. The California Division of Mines and Geology (CDMG) has determined that the planning area is located in an area of generally low susceptibility to landslides (see Appendix 3). However, certain areas are susceptible to landslides in the planning area (see Appendix 11 for location of these areas).

For more information on the geology and topography of the planning area see Bailey and Alt & Hyndman (list of references are contained in Appendix 1).

SOILS:

The soils in the Weed planning area are named "Shasta" or "Shasta Association" and do not contain any characteristics that are of importance to the issues of the safety element.

The soils of the planning area are more thoroughly described in the Conservation Element of the Weed General Plan.

HYDROLOGY:

The Weed planning area is located in the Shasta River drainage basin. Two forks of Boles Creek and Beaughton Creek, tributaries of the Shasta River, flow through the planning area. A small, earthen-dammed reservoir (less than one surface acre), owned and maintained by the Southern Pacific Railroad, is located in the southern part of the planning area. Roseburg Forest Products owns two similarly sized ponds in the planning area.

Boles Creek has flooded on occasion (the last event was in January, 1974) and urban developed riparian areas are located in the 100 year flood zone. Consult the Flood Insurance Study conducted by the Federal Emergency Management Agency, Federal Insurance Administration study dated 7/20/81. The areas located in the 100 year flood zone are illustrated in the Flood Insurance Rate Map (community panel # 060649 001 B) that accompanies the above referenced Flood Insurance Study.

Ground subsidence is not a problem in the planning area according the CDMG (see Appendix 4).

SEISMOLOGY:

The CDMG has determined that the Weed planning area is located in an area of "moderate" earthquake severity zone and that northeastern California has a history of fault displacement (see Appendices 5 and 6). However, the Seismic Safety and Safety Element of the Siskiyou County General Plan has commissioned studies that indicate that the potential for earthquakes in Siskiyou County is not great when compared to the rest of California and other local natural hazards (see Appendix 7).

Since the Seismic Safety and Safety Element of the Siskiyou County General Plan has conducted studies more appropriate to Siskiyou County than the CDMG, this element will assume the analysis contained in the Siskiyou County Safety Element. Therefore, seismic hazards associated with earthquakes will not be addressed in this element.

For more detailed information regarding earthquakes in Siskiyou County see Siskiyou County Planning Department.

VULCANISM:

The Weed planning area is subject to potential volcanic hazards such as mudflows, lava flows, pyroclastic flows, and ash clouds associated with an eruption of nearby Mt Shasta. The CDMG has determined that the planning area is in an area of potential volcanic hazards (see Appendix 8). However, the planning area, while located in a volcanic eruption danger zone, is not in the "highest" volcanic hazard area (see Appendices 9 and 10). But, prudence dictates planning for the eruption of Mt Shasta.

Mt Shasta has erupted an average of once per 800 years during the last 10,000 and about once per 600 years during the last 4,500 years. The last known eruption occurred 200 years ago. Recent eruptions produced lava flows and domes on and around the flanks of Mt Shasta and pyroclastic flows extended up to 20 kilometers (approximately 12 miles) from the summit. In addition, most eruptions produced mudflows that extended many tens of kilometers from the summit. Lava and pyroclastic flows may affect low-lying areas within approximately 20 kilometers of the summit. If future events can be predicted from past eruptions, Mt Shasta is not likely to erupt large volumes of pumiceous ash. Prevailing winds and other conditions would indicate that the greatest danger from air-borne tephra (tephra is any material ejected from the volcano during an eruption) is located to the east of Mt Shasta. (Miller, 1980).

For more detailed information on the Mt Shasta volcano in particular and vulcanism in general please consult Bailey, Alt & Hyndman, and especially Miller.

Future eruptions of Mt Shasta could pose great hazards for the Weed planning area. Lava, pyroclastic, and mud flows pose the greatest threat to the planning area. In addition, an eruption that melts the often massive snow pack on Mt Shasta could cause rapid and extensive flooding in the planning area.

WILDLAND AND URBAN FIRES:

The Weed planning area is surrounded mainly by forests and/or brushland. Therefore, the potential for wildland fires affecting the planning is present should a local forest or brush fire burn "out of control".

The potential for damage associated with wildland fires is greatest in the following areas: Hillside Drive (nearby schools and residential), west and south of College Avenue (nearby College of the Siskiyous and residential), Bel Air street (residential), Lincoln Heights area (residential), Siskiyou/Black Butte Avenues (retail commercial, residential), Carrick Addition area (retail commercial, residential) and other areas. See Safety Appendix for location of these areas.

The potential for hazards associated with urban fires is greatest in areas with the following conditions: building structures spaced too closely, roadway widths too narrow for fire equipment, and inadequate water system conditions (inadequate water pressure or fire hydrants, etc). The following areas (see Safety Appendix for location) have been identified as inadequate regarding hazards associated with urban fires:

- 1) Main Street (buildings inadequately spaced).
- 2) Angel Valley (inadequate water pressure).
- 3) Lombardi, Florence, and Alamo streets (inadequate roadway width).

According to City officials (Rick Bothwell, Director of Public Works, 10/6/86, personal communication), the City's water supply is sufficient to meet all anticipated fire protection needs. The City has three sources of water which can be utilized to meet fire suppression needs in and around the City of Weed.

HAZARDOUS MATERIALS:

There is the potential for safety dangers associated with hazardous materials from three sources: Southern Pacific Railroad operations, trucking operations on Highways 5 and 97 and City streets, and gasoline fires on Weed Boulevard .

SP Railroad operates approximately 24 trains per day through the Weed planning area. The need for "switching" tracks, curves in the tracks, and landslide potential along the tracks exacerbate the potential for an accident involving hazardous materials.

Trucks transporting hazardous materials pass through the planning area many times daily (possibly as often as every hour). In addition, trucks exiting from Interstate Highway 5 to State Highway 97 must pass through the main retail center in the planning area. Excessive speed on the highways, many local and tourist motorists coupled with the often-congested retail area pose a situation for an accident or spill involving hazardous materials.

There are 8 retail gasoline stations located within 1/2 mile of each other on Weed Boulevard. This area, is an area of potential hazards associated with gasoline fires or spills. The potential for an accident involving hazardous materials is present in the Weed planning area. Appropriate plans and procedures can prevent or mitigate hazards associated with hazardous materials.

PLANNING AND SAFETY ISSUES

The following safety concerns are not present in the Weed planning area and need not be addressed in this element: seismically induced ground rupture, ground shaking, ground failure, subsidence, tsunami, seiche, and dam failure.

VULCANISM:

The dangers associated with an eruption of Mt Shasta pose safety concerns to the residents of the Weed planning area. Obviously, prevention of an eruption is impossible. However, measures can be enacted that can lessen the potential loss of lives and property if a major eruption should occur. The development of contingency plans should include the following:

- 1) Limited and total evacuation plans and procedures.
- 2) Limit access to and use of potentially hazardous areas if an eruption is imminent.
- 3) Evaluation of the possible effects of tephra, mudflows, lava flows, pyroclastic flows, and flooding on transportation routes, communication systems, water supplies, and utilities.
- 4) Evaluation of land use plans for development around Mt Shasta.
- 5) Training of emergency response personnel.
- 6) Evaluation of existing mutual aid agreements with local, state, and federal emergency response agencies.
- 7) Education of the local populace regarding early-warning signs of an imminent eruption and emergency response plans.

FLOODING:

Some flooding problems do exist in the Weed planning area primarily from high water on Boles Creek. Appropriate flood management planning can reduce the loss of life, damage to property, and the economic and social dislocation resulting from flooding.

The 100 year flood plain is the basic planning criteria to identify areas in which precautions should be taken. Flood management planning should affect this zone. Flood management planning does not mean prohibiting development within the 100 year flood plain. Rather, these areas should be designed for non-intensive uses so that loss of life and property can be minimized.

The National Flood Insurance Act offers an important incentive for implementation of a flood management plan. Property owners in the flood plain may obtain federally subsidized flood insurance if local agencies adopt flood management regulations and participates in the federal program.

A Flood Insurance Study, dated 7/20/81, was conducted by the Federal Emergency Management Agency in the planning area. The data and recommendations developed in this study should be utilized in the land use element and local building code.

Overlay zoning in 100 year flood zones is an important planning tool that can be implemented to minimize damage to property and persons in the planning area.

LANDSLIDES:

There are some areas on the slopes of the few hills in the Weed planning area that may be subject to landslides (see Safety Appendix).

As with flooding, management of landslide hazard zones does not mean prohibiting development in these areas. However, procedures can be implemented to reduce the potential for loss of life and property or mitigation measures can be required to reduce the risks associated with development of these landslide-prone areas.

Overlay zoning in the landslide hazard areas is an important planning tool that can be implemented to minimize damage to property and persons in the planning area.

WILDLAND AND URBAN FIRES:

Appropriate planning can reduce the risk of urban and wildland fires. Local agencies can implement the measures contained in the "FIRE SAFE GUIDES FOR RESIDENTIAL DEVELOPMENT IN CALIFORNIA" published and updated by the US Forest Service and the California Division of Forestry. This manual provides measures that can be taken by property owners and governmental officials to reduce the risks presented by wildland fires. In addition, there are many

publications and plans available to the Weed volunteer fire department to reduce the risks associated with urban fires.

City officials can also reduce the risks associated with urban and wildland fires by

- 1) Evaluating the water system to ensure adequate water supplies in the worst case fire situation. This evaluation should include number and location of fire hydrants, areas of low water pressure, and the overall system water storage capacity. If deficiencies are found, appropriate mitigation measures can be pursued.
- 2) Evaluating mutual aid agreements with local, state, and federal fire suppression agencies such as the CDF, USFS, Mt Shasta City, and Siskiyou County fire suppression agencies.
- 3) Sponsor training for the local fire department.
- 4) Enforce regulations prohibiting excessive plant growth or other flammable materials on private property.
- 5) Evaluating the current resources of the local fire department and, if deficiencies are found, enact plans to correct the deficiencies.
- 6) Evaluate the present communication system for adequacy regarding prompt fire reporting.

Again, overlay zoning in areas subject to wildland fires is an important planning tool to minimize damage to property and persons.

HAZARDOUS MATERIALS:

Procedures and plans can be enacted to better protect the residents of the Weed planning area from the risks associated with accidents involving hazardous materials. As noted earlier, hazardous material risks are associated with three operations: Southern Pacific Railroad, trucking on highways and City streets, and gasoline stations in the City.

SP Railroad has developed an advisory document entitled "HOW TO OBTAIN EMERGENCY RESPONSE INFORMATION - A GUIDE FOR FIREMEN". This publication recommends that local agencies proceed first by determining the contents of the affected car(s) by an examination of waybills in the train or contacting SP operations via a 24-hour telephone service with the car number(s) if a waybill is not available. Once the contents of the affected car(s) is known, local agencies should consult the SP booklet entitled "EMERGENCY HANDLING OF HAZARDOUS MATERIALS IN SURFACE TRANSPORTATION" for proper procedures and handling of the hazardous material. Once this information is obtained, local officials can determine appropriate actions in consultation with expert personnel and local emergency response plans.

The California Vehicle Code assigns overall responsibility for highway accidents involving hazardous materials to the California Highway Patrol. A CHP operations manual outlines the roles of appropriate federal, state, and local agencies and notes that City police departments shall act as "scene manager" for hazardous material incidents within their jurisdictions. In addition, local agencies do have responsibility for the residents in their jurisdictions in any emergency.

There are publications available for the prevention and mitigation of the effects of gasoline fires. In addition, there are procedures that can be implemented by local fire departments that can limit the "spread" of any fire that would occur along south Weed boulevard.

From the above discussion, it appears that, while assistance is provided by private, state, and federal agencies, local fire, police, and emergency response agencies and officials have most of the responsibility for handling an accident involving hazardous materials. Since this is the case, appropriate policies, plans, and procedures must be enacted and local personnel be provided on-going training so that the residents and property in the planning area may best be protected from the risks associated with an accident involving hazardous materials.

LIST OF APPENDICES

S-1) List of References.

S-2) Map of Geologic Features in the Region of the Weed planning area.

S-3) Map of Relative Amounts of Landslides in California.

S-4) Map of Subsidence Areas in California.

S-5) Map of Maximum Expectable Earthquakes in California.

S-6) Map of Historic and Quaternary Fault Displacement in California

S-7) Summary of Conclusions Regarding Earthquakes in Siskiyou County, California

S-8) Map of Areas of Potential Volcanic Hazards in California. .

S-9) Zones of Potential Hazard from Lava Flows from Future Eruptions in the Vicinity of Mt. Shasta, California

S-10) Zones of Potential Hazard from Pyroclastic Flows and Associated Ash Clouds and Mudflows that may result from Future Eruptions in the Vicinity of Mt. Shasta, California.

S-11) Map of Urban Fire, Wildland Fire, and Landslide Hazards.

APPENDIX S-1

LIST OF REFERENCES

Alt D. and Hyndman D., 1975, Roadside Geology of Northern California, 244 pages

Bailey E., Editor, 1966, Geology of Northern California, California Division of Mines and Geology, Bulletin 190, 507 pages.

Federal Emergency Management Agency, 1981, Flood Insurance Study of the City of Weed, Community Number 060649, 13 pages plus maps

Miller, C. Dan, 1980, Potential Hazards from Future Eruptions in the Vicinity of Mount Shasta Volcano, Northern California, US Geological Survey, Bulletin 1503, 43 pages plus maps.

Siskiyou County Planning Department, 1975, Seismic Safety and Safety Element, Siskiyou County General Plan, 94 pages.

Appendix S-2) Map of Geologic Features in the Region of the Weed planning area.

Appendix S-3) Map of Relative Amounts of Landslides in California.

Generalized Map Showing
RELATIVE AMOUNTS OF LANDSLIDES
 In California

EXPLANATION

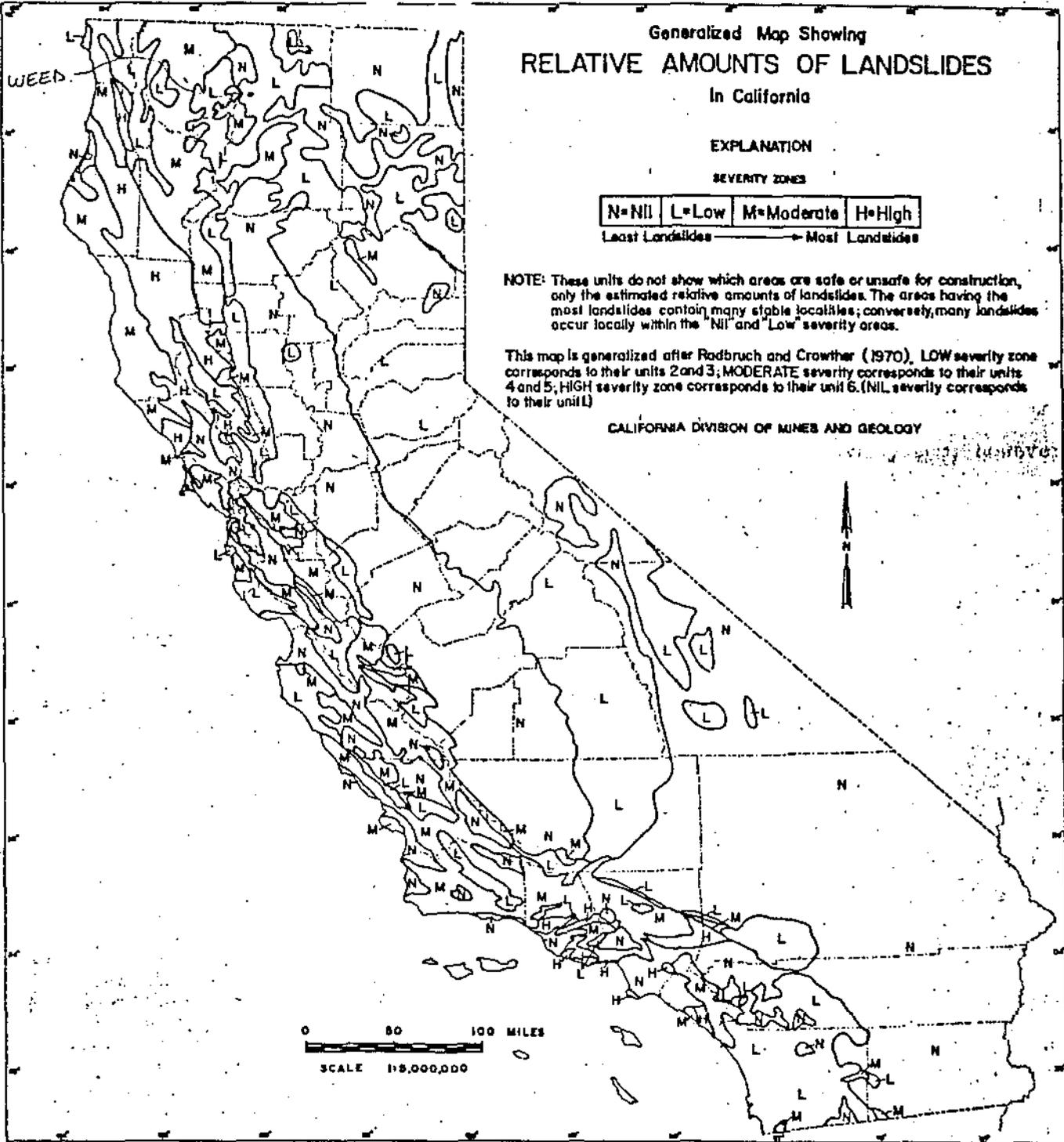
SEVERITY ZONES

N=Nil	L=Low	M=Moderate	H=High
Least Landslides ← → Most Landslides			

NOTE: These units do not show which areas are safe or unsafe for construction, only the estimated relative amounts of landslides. The areas having the most landslides contain many stable localities; conversely, many landslides occur locally within the "Nil" and "Low" severity areas.

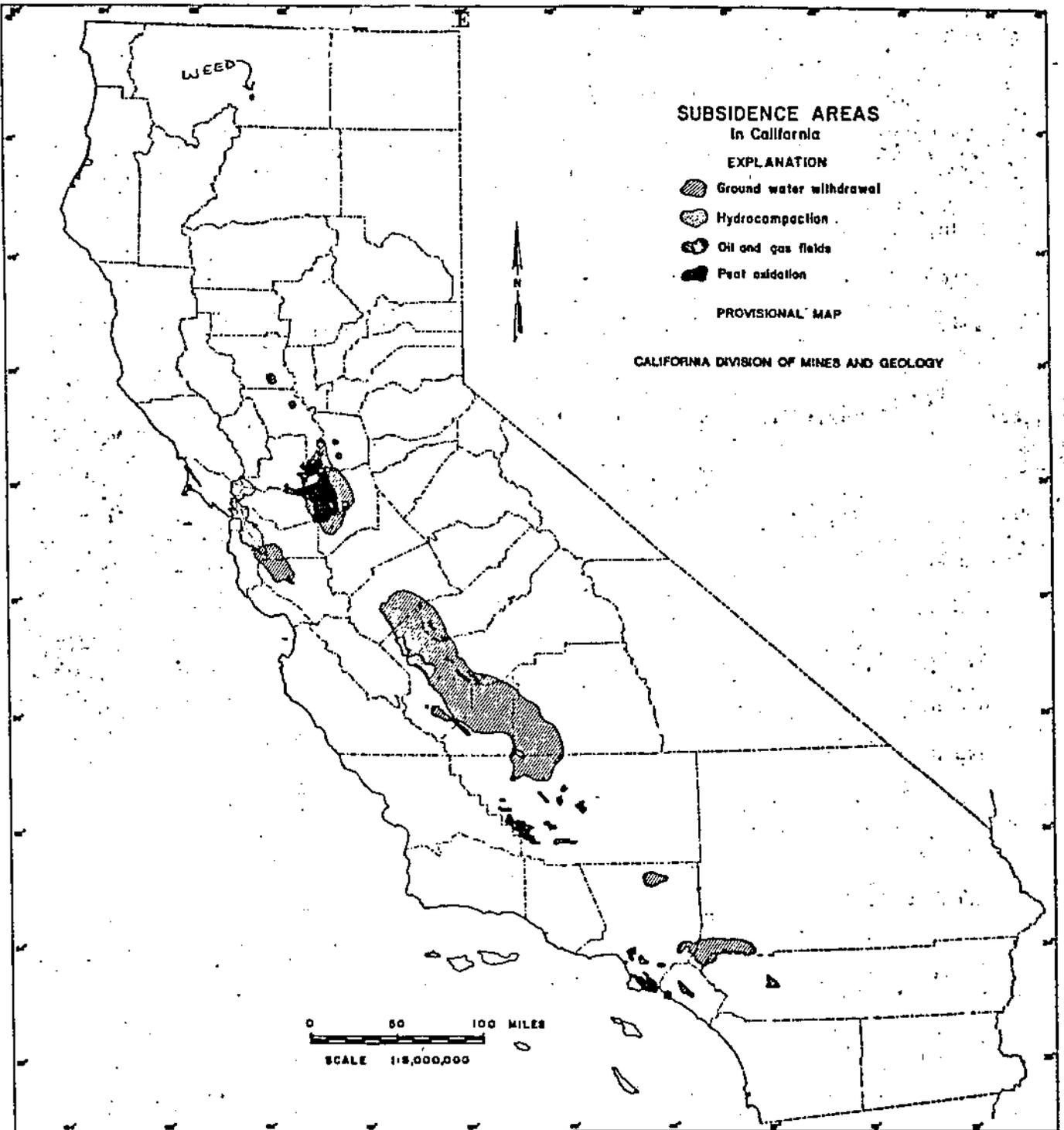
This map is generalized after Radbruch and Crowther (1970). LOW severity zone corresponds to their units 2 and 3; MODERATE severity corresponds to their units 4 and 5; HIGH severity zone corresponds to their unit 6. (NIL severity corresponds to their unit 1)

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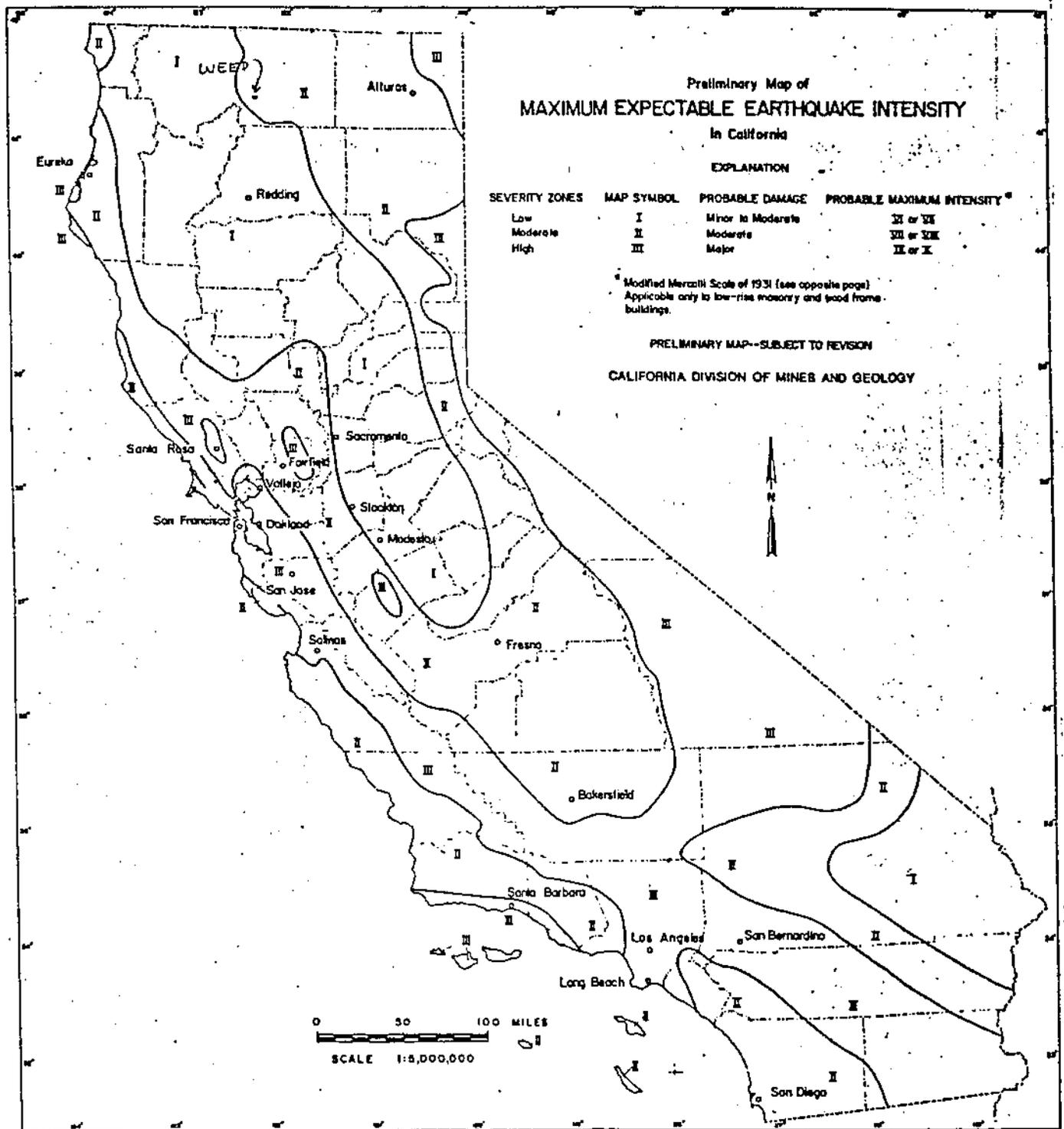
Generalized map showing relative amounts of landslides in California.

Appendix S-4) Map of Subsidence Areas in California.



Subsidence areas in California.

Appendix S-5) Map of Maximum Expectable Earthquakes in California.



Preliminary map of maximum expected earthquake intensity in California.

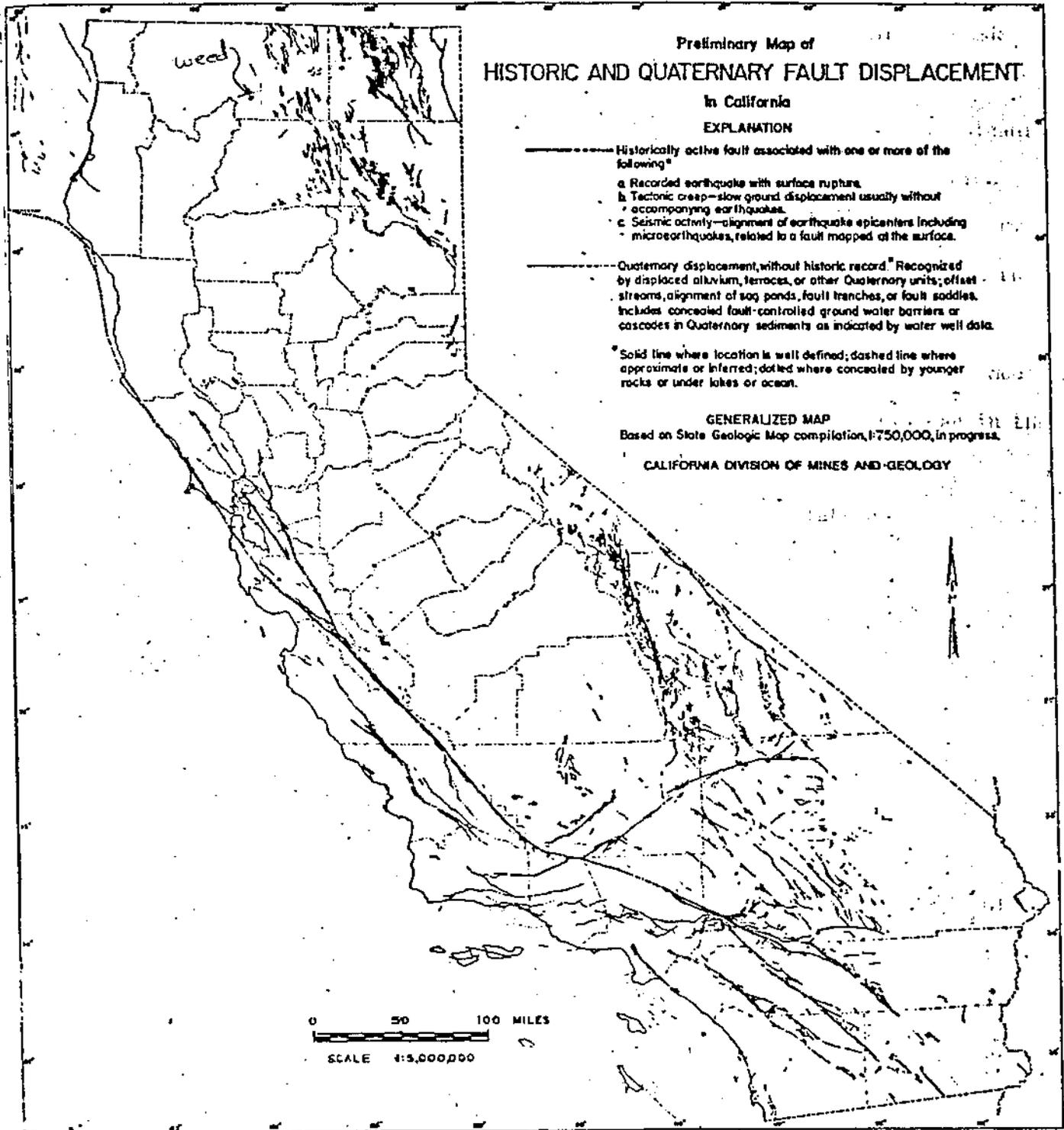
Appendix S-6) Map of Historic and Quaternary Fault
Displacement in California

Preliminary Map of
HISTORIC AND QUATERNARY FAULT DISPLACEMENT
 In California

EXPLANATION

- Historically active fault associated with one or more of the following^a
 - a Recorded earthquake with surface rupture.
 - b Tectonic creep—slow ground displacement usually without accompanying earthquakes.
 - c Seismic activity—alignment of earthquake epicenters including microearthquakes, related to a fault mapped at the surface.
 - Quaternary displacement, without historic record.^b Recognized by displaced alluvium, terraces, or other Quaternary units; offset streams, alignment of sag ponds, fault trenches, or fault saddles. Includes concealed fault-controlled ground water barriers or cascades in Quaternary sediments as indicated by water well data.
- ^a Solid line where location is well defined; dashed line where approximate or inferred; dotted where concealed by younger rocks or under lakes or ocean.

GENERALIZED MAP
 Based on State Geologic Map compilation, 1:750,000, in progress.
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Preliminary map of historic and Quaternary fault displacement in California.

Appendix S-7) Summary of Conclusions Regarding Earthquakes
in Siskiyou County, California

SUMMARY OF CONCLUSIONS

1. Existing seismic risk maps of California and the United States are unreliable because they are not based upon more detailed study of smaller areas. Also, existing maps are contradictory in some county-sized areas, and there is no objective way to choose which is correct.
2. Earthquake history is the most objective guide to the future that is presently available to us.
3. There is written record of 295 earthquakes having occurred in Northeast California since 1851; 22 of these achieved an intensity of VI (M.M.), 10 an intensity of VII, and one questionable occurrence of intensity VIII.
4. Of known earthquakes in the region, 90% were of intensity V or less, capable only of very minor damage or no damage at all.
5. There have not been any injuries or deaths caused by earthquakes in the region.
6. Property damage caused by earthquakes in the region has been very small.
7. There is no evidence of an earthquake greater than magnitude 6.5 having occurred in the region.
8. Earthquakes occurring outside the region in California, Nevada, and Oregon have not had any greater effects in the region than much smaller earthquakes originating within the boundaries of the region.
9. There are four small areas within the region that should be treated as active faults. Each of these should be investigated more, but do not appear to be of major concern. Building should not be permitted in these areas.
10. There are many faults that must be regarded as potentially active, but they do not pose a serious threat.
11. There are two large faults, the Honey Lake fault and the Surprise Valley fault, that should become the subjects of additional study. While there is no evidence that they are dangerous, evidence is not yet complete.
12. There are many faults in the region that can be classified as inactive.
13. Planning within the region should be based upon a maximum intensity earthquake of VIII (M.M.). Such earthquakes will not occur frequently.

14. The hypothetical intensity VIII earthquake might occur anywhere in the region.
15. Earthquake hazard in Northeast California is not great compared to the rest of California.
16. Earthquake hazard in Northeast California is not great when compared with other natural hazards in the same region.

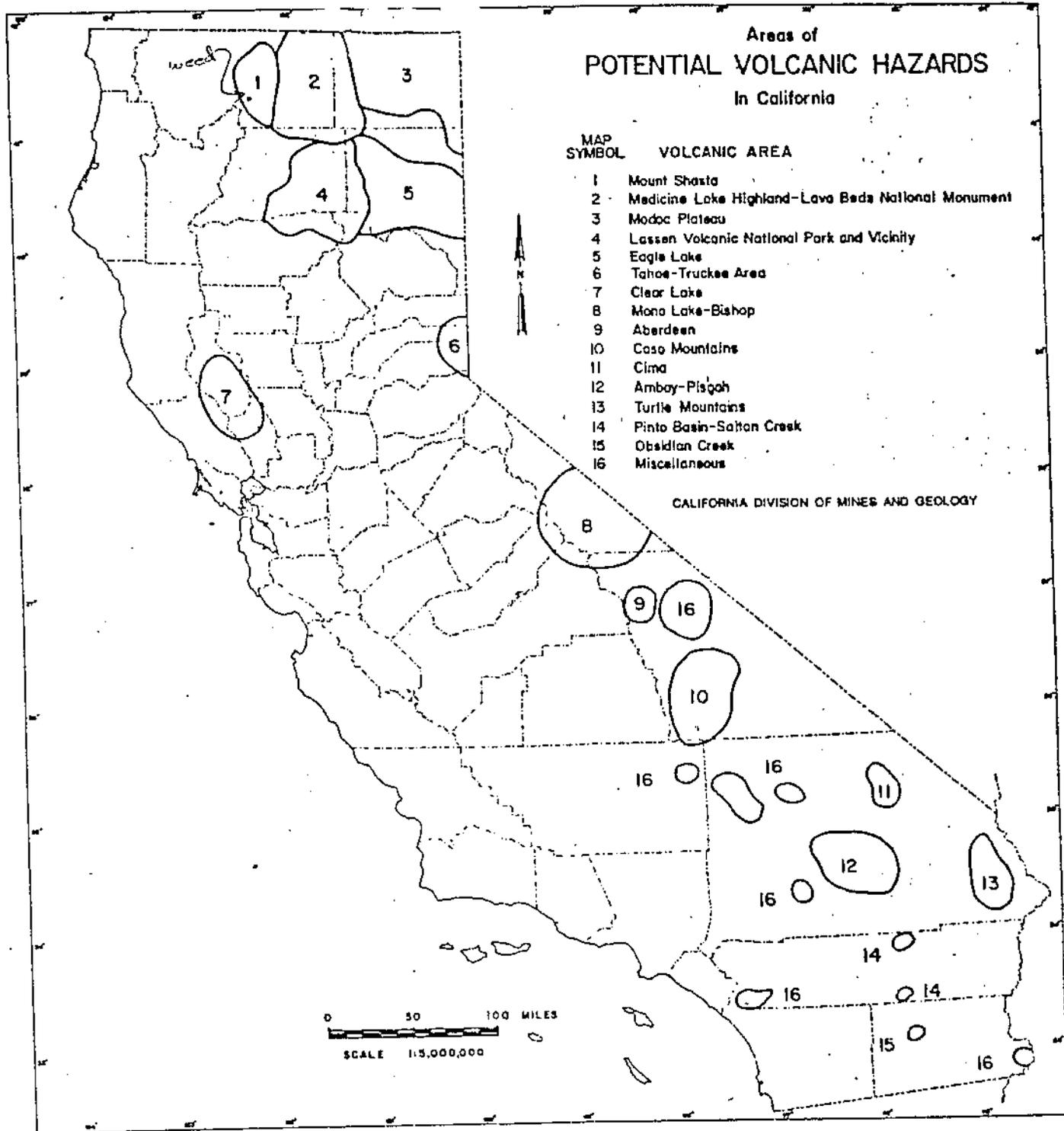
Appendix S-8) Map of Areas of Potential Volcanic Hazards in California.

Areas of POTENTIAL VOLCANIC HAZARDS In California

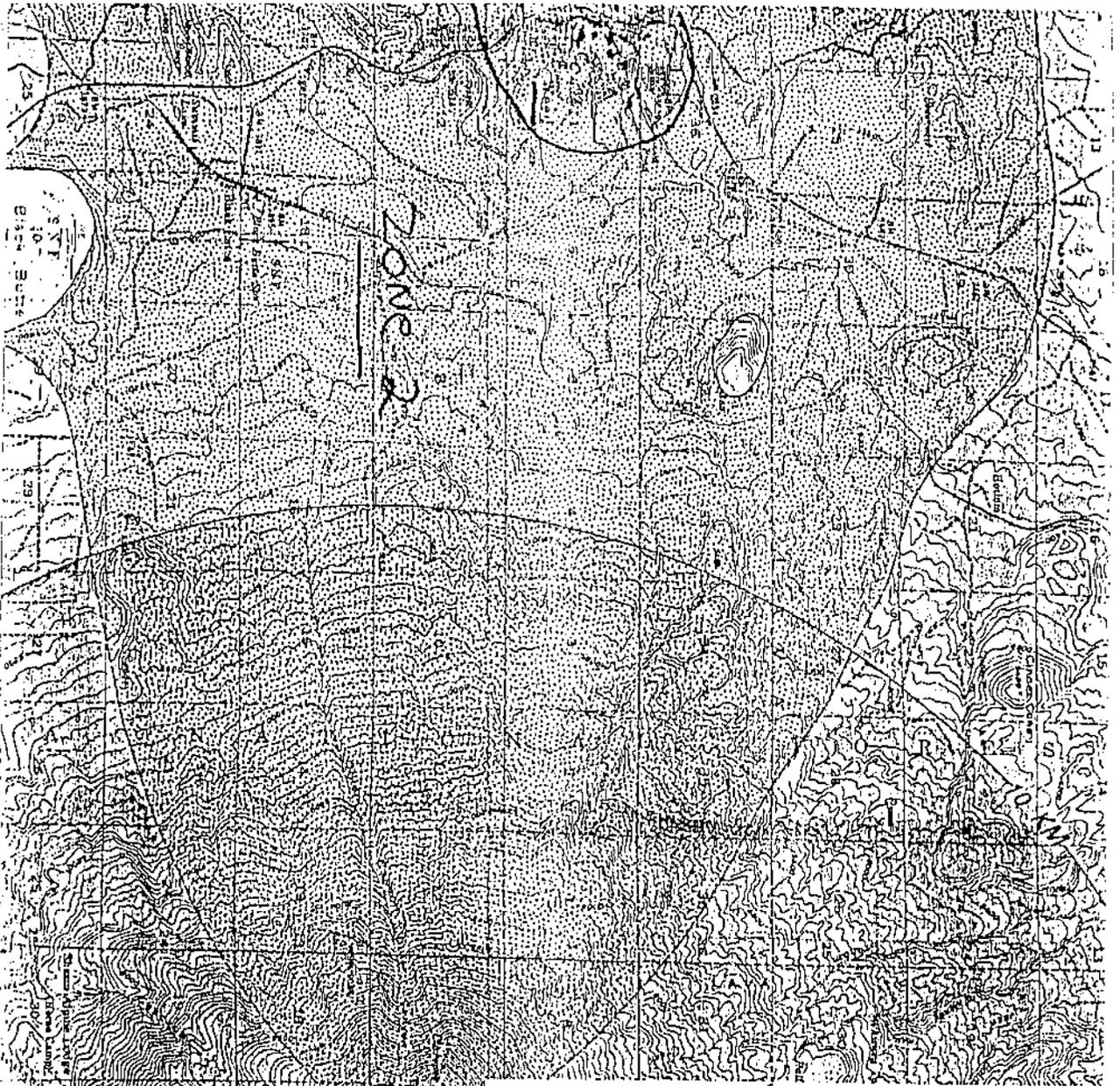
MAP SYMBOL VOLCANIC AREA

- 1 Mount Shasta
- 2 Medicine Lake Highland-Lava Beds National Monument
- 3 Modoc Plateau
- 4 Lassen Volcanic National Park and Vicinity
- 5 Eagle Lake
- 6 Tahoe-Truckee Area
- 7 Clear Lake
- 8 Mono Lake-Bishop
- 9 Aberdeen
- 10 Coso Mountains
- 11 Cima
- 12 Amboy-Pisgah
- 13 Turtle Mountains
- 14 Pinto Basin-Saltan Creek
- 15 Obsidian Creek
- 16 Miscellaneous

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Appendix S-9) Zones of Potential Hazard from Lava Flows from
Future Eruptions in the Vicinity of Mt. Shasta, California



ZONES OF POTENTIAL HAZARD ASSOCIATED WITH FUTURE EREPTIONS IN THE VICINITY OF MOUNT SHASTA, CALIF.

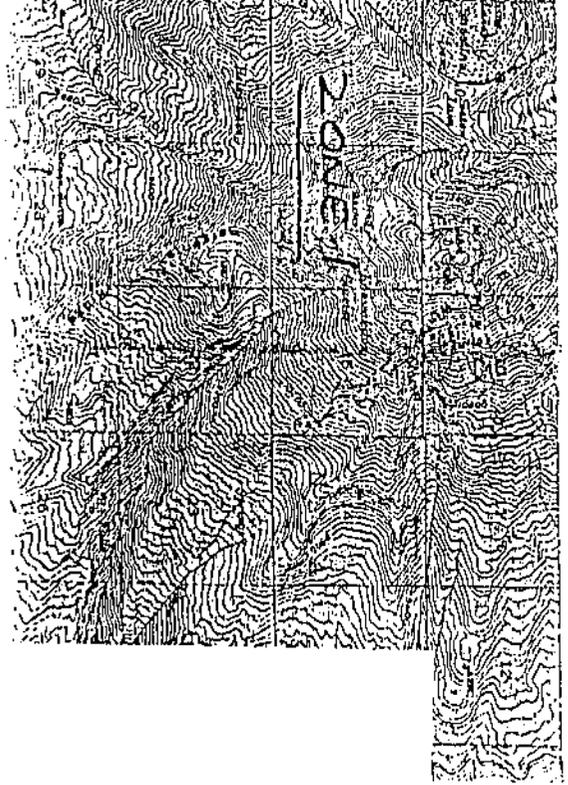
EXPLANATION

FLOWAGE HAZARD ZONES—Blank areas within hazard zones are hills thought to be too high to be reached by pyroclastic flows or mudflows. These areas, however, may be affected by ash clouds and air blasts associated with pyroclastic flows. The area west of Shasta, within hazard zones 1, 2, and 3 (shown by dot pattern), is not likely to be directly affected by pyroclastic flows or mudflows originating near the summit or on the north, east, or south flanks of Mount Shasta. The area will probably be shielded from such flowage deposits by the cone of Shasta. This area, however, may be affected by air blasts and ash clouds associated with pyroclastic flows originating near the summit or on the north, east, or south flanks of Mount Shasta.

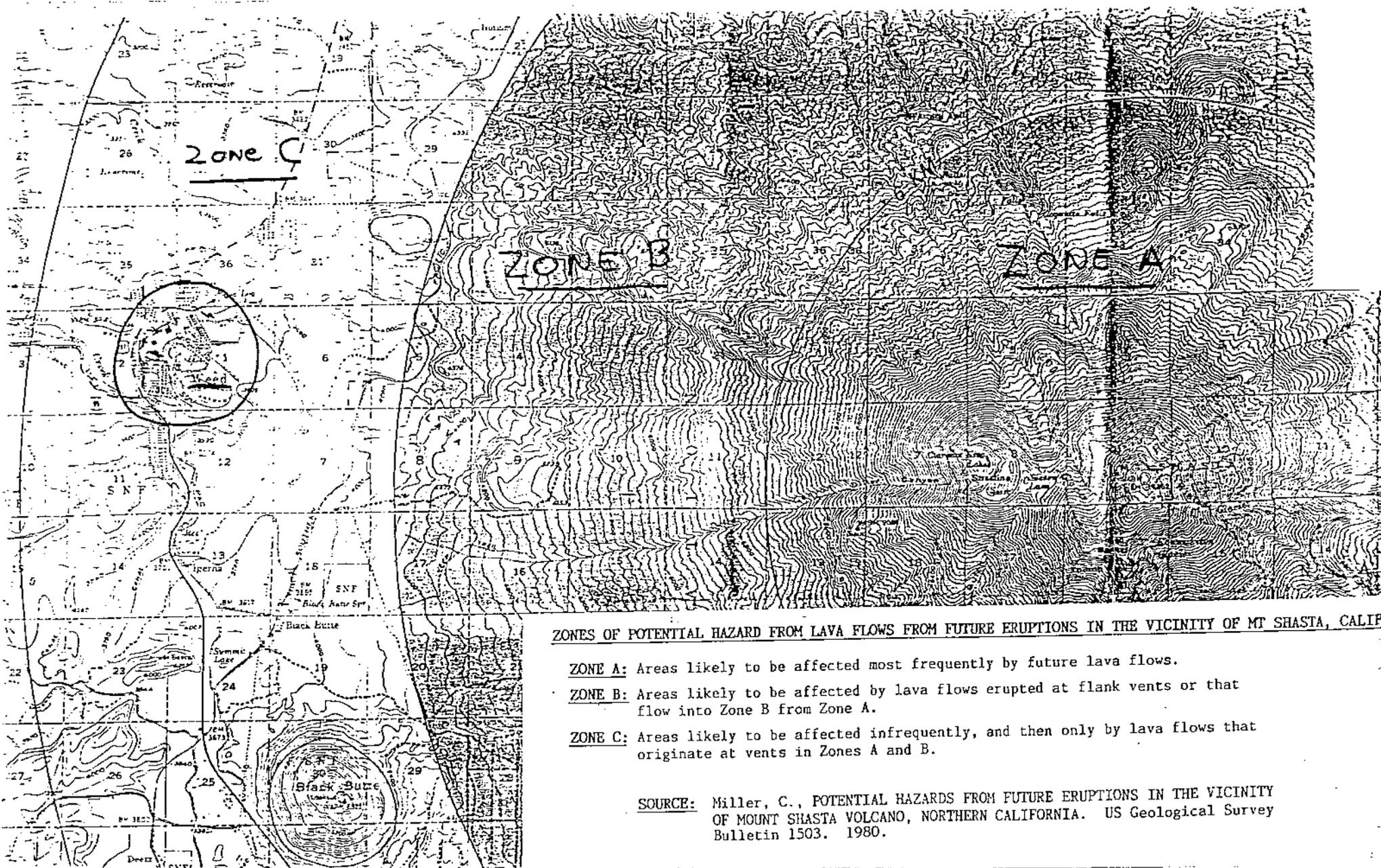
Zone 1—Areas likely to be affected most severely and most frequently by pyroclastic flows and associated ash clouds, lateral blasts and mudflows resulting from future eruptions.

Zone 2—Areas of intermediate potential hazard likely to be affected less frequently by pyroclastic flows and associated ash clouds and mudflows from future eruptions.

SOURCE: Miller, C., POTENTIAL HAZARDS FROM FUTURE EREPTIONS IN THE VICINITY OF MOUNT SHASTA VOLCANO, NORTHERN CALIFORNIA. US Geological Survey Bulletin 1503. 1950.



Appendix S-10) Zones of Potential Hazard from Pyroclastic Flows and Associated Ash Clouds and Mudflows that may result from Future Eruptions in the Vicinity of Mt. Shasta, California.



ZONES OF POTENTIAL HAZARD FROM LAVA FLOWS FROM FUTURE ERUPTIONS IN THE VICINITY OF MT SHASTIA, CALIF

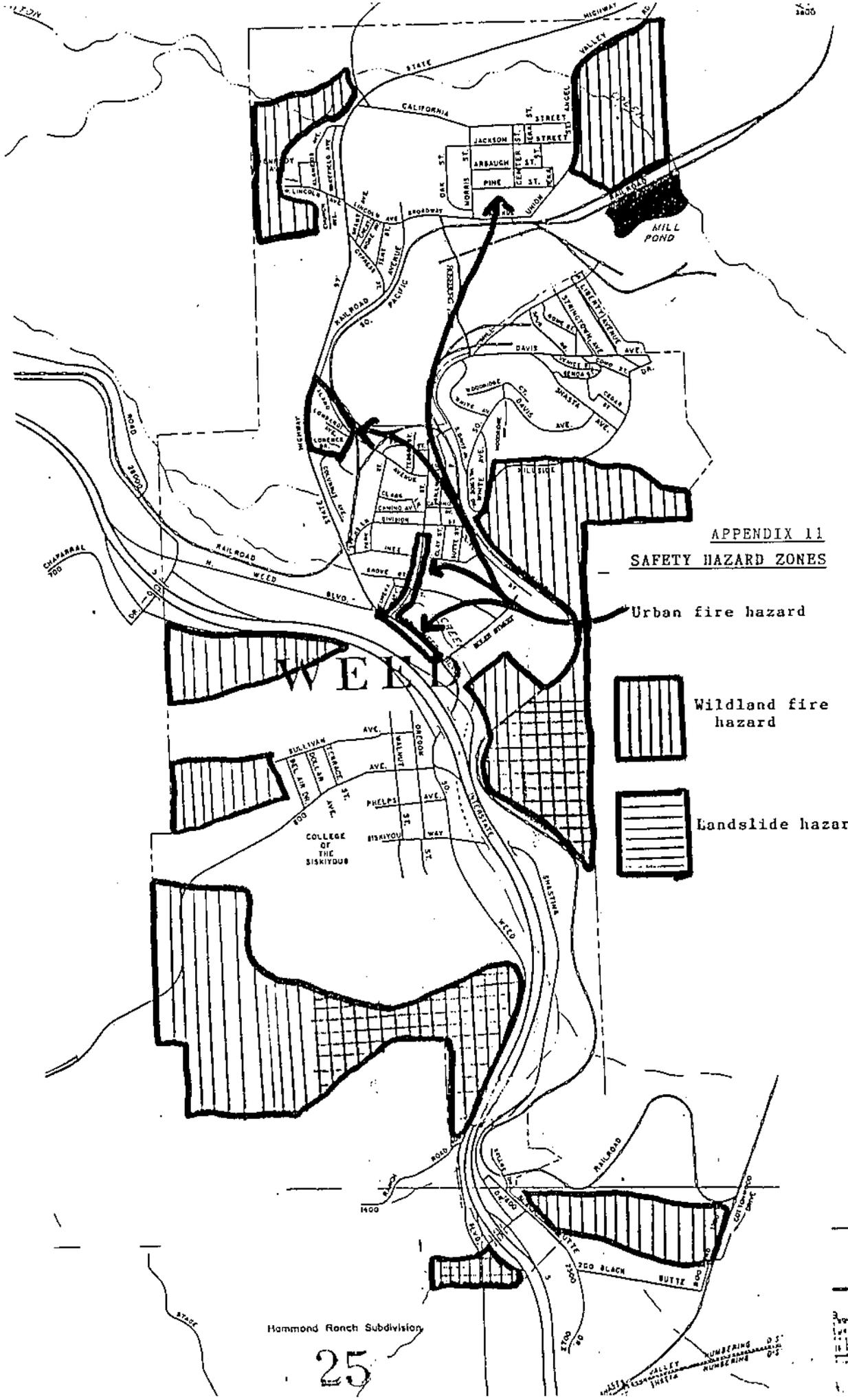
ZONE A: Areas likely to be affected most frequently by future lava flows.

ZONE B: Areas likely to be affected by lava flows erupted at flank vents or that flow into Zone B from Zone A.

ZONE C: Areas likely to be affected infrequently, and then only by lava flows that originate at vents in Zones A and B.

SOURCE: Miller, C., POTENTIAL HAZARDS FROM FUTURE ERUPTIONS IN THE VICINITY OF MOUNT SHASTA VOLCANO, NORTHERN CALIFORNIA. US Geological Survey Bulletin 1503. 1980.

Appendix S-11) Map of Urban Fire, Wildland Fire, and
Landslide Hazards.



APPENDIX 11
SAFETY HAZARD ZONES

Urban fire hazard



Wildland fire hazard



Landslide hazard

Hammond Ranch Subdivision

VALLEY NUMBERING D.S.
CLARK NUMBERING D.S.