

# THE ALPINE MEADOWS ROAD AVALANCHES, REAL ESTATE AND POLITICS

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**ABSTRACT:** This case study will review the history of the avalanche problems effecting the Alpine Meadows Road and the resulting legal and political ramifications. The three mile county road provides access to the Alpine Meadows Ski Area and to two large residential subdivisions. Over 30 homes are built within the avalanche paths along or adjacent to the road. Avalanche potential was not considered in the initial route selection of the road or the development of the homesites along the road. The ski area, through a contract with the county provides avalanche forecasting and control services to protect the road. As a result of a relaxation of county avalanche zoning laws additional structures have been built within the avalanche paths along the road. In recent years both natural and artificially released avalanches have damaged homes and structures along the road. The potential for a large catastrophic avalanche event has resulted in the ski area, the county, the property owners of the avalanche paths and the homeowners along the road to reevaluate their responsibilities and liabilities.

**KEYWORDS:** avalanche control, avalanche protection, avalanche zoning

## 1. INTRODUCTION

The three mile long Alpine Meadows Road provides access to the Alpine Meadows Ski Area and to two large residential subdivisions. The 2000 acre ski area which is located in the Bear Creek Valley is situated just east of the Sierra Nevada crest near Lake Tahoe, California. The road which begins at California State Highway 89 and ends at the ski area is owned by Placer County. The roadway was laid out and the road built during the summer of 1960 to provide access to the ski area which was under construction. The

road travels up the north side of the valley traversing across or below several small and moderate size avalanche paths.

In addition to providing access to the ski area the road also provides access to hundreds of homes. On a peak day thousands of vehicles may travel on the road. The ski area, which is one of the largest employers in the area, employs hundreds of employees who use the road. Emergency services such as police, fire and ambulances frequently use the road. The road is a vital link in the community.

## 2. ROAD ALIGNMENT

The current road alignment along the north side of the valley results in the roadbed traversing across or below several avalanche paths. These paths range from 100 meters to

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350 meters in vertical height. Generally the roadbed was cut into the hillside in the lower half of the track of these paths.

It is not clear at this time why this alignment was chosen. An alternative route up the south side or middle of the valley would have avoided most if not all avalanche paths. Why these alternatives were not chosen is not entirely clear, but apparently may have had to do with the location of the subdivisions.

The developers of the ski area developed a residential subdivision half way up the valley during the same period. A second residential subdivision lower down the valley was also developed during this period. Both subdivisions were located in the flatter more desirable land in the middle and south side of the valley. Although there are no written records it appears the current road alignment was chosen to save the flatter land to the south for residential construction. Unfortunately the layout of the subdivisions also resulted in many homesites along and below the access road being placed in the track and runout zones of avalanche paths.(see map)

During the development and construction of the ski area and the road the developers consulted Monty Atwater, the United States Forest Service Snow Ranger who at the time was working at Squaw Valley in preparation for the 1960 Winter Olympics. Although the full extent of Atwater's advice is no longer available, apparently as a result of his input one section along the road was not subdivided because of the threat of avalanches from above the road. This undeveloped section is below the East and West gullies which are the two largest paths threatening the road. Whether or not Atwater recognized the other paths along the road and above homesites and or advised the developers of the avalanche threat is unknown.

### 3. Avalanche Control Above the Road

Within the first few years of the ski area's operation, avalanches both within the ski area and along the road created many problems. During the ski areas development Atwater recognized the extensive avalanche potential within the ski area and as a result suggested the use of artillery to supplement the use of handcharges. During the early 1960s the ski area developed hand charge routes to control the paths above the road. To access the starting zones the control teams were driven to Squaw Valley, the next valley to the north, and rode the KT22 Chairlift to the top of the ridge separating Squaw Valley from Bear Creek. The paths above the road were then controlled by handcharges as the control teams skied along the ridge and back into Bear Creek. This is a procedure used to this day.

As part of this control procedure the ski area personnel would clear the Alpine Meadows Road of vehicles and pedestrians by closing and sweeping the road. The road was then reopened when control was complete and any snow deposited on the road had been removed. During the early years this procedure was accomplished with limited personnel, no two way radios and inadequate snow removal equipment. In general this is the procedure currently in operation today. The operation is now more complex due to the numerous homes along the road and the potential for avalanches reaching and damaging those structures, the residents within those homes who must be warned of the control operation and the significant increase in both vehicle and foot traffic on the road, Over the years the clearing operation has been refined and now utilizes more manpower and better communication and snow removal equipment. From the early days to the present the ski area has provided both day to day snow removal as well as avalanche debris removal from the road.

In 1966 Norm Wilson took over the avalanche control operation for the ski area. Norm had extensive control experience. During and in preparation for the 1960 Squaw Valley Olympics he worked for the California Olympic Organizing Committee as a Snow Safety Specialist under the direction of Dick Stillman. Following the Olympics he worked until 1965 as the state of California's Snow Safety Specialist at Squaw Valley. Norm brought with him considerable experience in using artillery to control avalanches. Coincidentally, the late 1960s brought heavy winters to the Sierra Nevada and Alpine Meadows.

During the late 60s avalanches repeatedly buried the Alpine Meadows Road. This resulted in damage to some of the few homes along the road and road closures for days at a time, including 22 days of closures during the winter of 1966/1967. Often during the large storms of this period the winds were too high to allow control teams to ride KT22 and access the starting zones above the road for handcharging. As a result of his artillery experience Wilson proposed the use of a 75mm howitzer to shoot the paths above the road. Wilson lobbied both the Forest Service and the county for permission. While the various public agencies and private landowners and their lawyers discussed their concerns, the requirements and the legal ramifications, Wilson and the snow ranger did what they had to do.

It was not until 1972, one year after Wilson left Alpine Meadows, that the various agreements were finalized which formally allowed the ski area to perform avalanche control above the road. The agreements included both handcharging and artillery control. Reluctantly the ski area agreed to act as a contractor to the county and to insure and indemnify the county. In exchange the county would pay the ski area a small sum for each control mission. The ski area also agreed to insure and indemnify the two landowners who

owned the starting zones that control was performed on. The Forest Service agreed to allow their howitzer to be used if all parties were satisfied with the various agreements. Although there have been minor changes the same agreements are currently in place.

During the 70s control above the road was accomplished with a combination of handcharging and artillery. Generally, if weather allowed, handcharges were used. If the weather was too windy to ride Squaw Valley's KT22 Chairlift, the howitzer was used. The procedure when using the howitzer was to tow it behind a vehicle to predetermined sites which allowed the cannon to be sighted on the numerous starting zones but keep the weapon and gunners out of the avalanche path. This operation was usually required and conducted during fierce weather with limited visibility. There was no blind firing data and all shots had to be bore sighted. Targeting was often difficult.

After the two heavy winters of 1981/1982 and 1982/1983 and numerous problems gaining access to the starting zones above the road and sighting the howitzer in poor visibility the ski area invested in two new methods of control. The first was the construction of a gun building within the subdivision which allowed the howitzer to be permanently housed at a fixed position. Blind firing data was developed for this position which allowed the cannon to be used regardless of the visibility. The second improvement to be added was avalanche launchers. Initially one launcher was mounted on a flat bed truck. This allowed control teams to quickly control the numerous small paths along the road. After this proved to be successful a second launcher was installed in the gun house. Blind firing data was developed for this launcher and it has proven to be both accurate and reliable in controlling the East and West Gully slide paths. Currently, depending on weather, avalanche hazard and operational considerations, a



combination of the vehicle mounted launcher, the building mounted launcher and handcharging are used for control above the road.

#### 4. PLACER COUNTY AVALANCHE ZONING

In 1982 following several avalanche events in Placer County which resulted in numerous deaths and injuries as well as destruction and damage to homes and structures the county hired Norm Wilson to provide a report on the avalanche hazard within the county and to map the avalanche paths within the county. In 1983 following Wilson's production of the report and maps the County Board of Supervisors enacted an avalanche ordinance. The ordinance identified areas within the County subject to potential avalanche danger. These were categorized into Red Zones(High Avalanche Hazard Zones), Blue Zones(Moderate Avalanche Hazard Zones) and Yellow Zones(Low Avalanche Hazard Zones). The ordinance required notice to occupants of the avalanche hazard zones and provided the specific language to use for each Zone. Most notably, the ordinance restricted building of houses within Red and Blue Zones unless the structures were designed for avalanche impact. The ordinance did allow for uninhabited structures unattached from houses to be built within Blue Zones without avalanche impact design.

As a result of the ordinance many undeveloped residential lots became unbuildable or expensive to build on. The ordinance had allowed some properties to be excluded from an avalanche zone if site a specific avalanche study, paid for by the property owner, determined that an individual property was miszoned. Based on public input, the County made revisions to the ordinance. The most recent revisions generally allow for more relaxed building

restrictions.

#### 5. THE CHANGING LANDSCAPE

In 1972 when the various agreements between the ski area, Placer County and the property owners of the avalanche paths above the road were implemented there were only a few homes along and below the road. At that time most of the concern for all parties to the agreements was to the avalanche hazard to the users of the road not the structures along the road. Only one home had sustained any significant damage. The cars that had been damaged had been parked along the road in the avalanche paths. During the early 70s the homes along the road as well as the homes constructed over the next decade, were on the down side of the road and did not have garages. Access to individual homes was from the Alpine Meadows Road where homeowners shoveled out parking spaces for their vehicles parallel to and along the county road. This resulted, at times in a large vertical cut snow bank. Most homeowners shoveled or cut steps through or over the bank and built snow paths to their homes. In most cases the houses were some distance down the slope below the road.

In 1982 at the time of Wilson's county wide avalanche evaluation most of the homes along the road did not have garages and were built down the slope along the edge of the road. At that time there were 12 to 15 houses along the road. The lack of garages and the practice of shoveling parking spaces parallel to the road resulted in a continuous vertical cut snow bank on the edge of the road and above the homes. The combined effect of the vertical snow bank and the flat roadway, which produced a break in the continuous slope of the hillside, provided unplanned avalanche protection to the homes below the road.

Several things occurred during the lighter winters of the late 80s and early 90s

for which the consequences would not be realized until the heavy snowfall winter of 1994/1995. During this period most of the homeowners along the road built garages. This was allowed in the 1983 avalanche ordinance which allowed for construction of an uninhabited detached structure to an existing house. As homeowners built garages they changed the traditional snow removal pattern in front of their homes along the roadway. All of the garages were built facing and up to the edge of the roadway. To access their garages they removed the snow in front of the garage. This new pattern of snow removal resulted in the elimination of the vertical snow bank and the protection it provided. Also during this period many new homes were built on the next road downslope, Deer Park Drive. Although this area was in a Blue Zone, construction was allowed both as a result of site specific studies which excluded the properties from the Blue Zone or as a result of a relaxation of building restrictions because of changes to the avalanche ordinance.

By the winter of 1994/1995 most of the lots along the Alpine Meadows Road had been developed with homes and garages. Additionally most of the lots on the next road down in the subdivision had been developed. This resulted in 12 to 15 homes along the road directly in the path of avalanches crossing the road and an additional 20 plus homes on Deer Park Drive being at risk.

During this same period other changes to the local demographics were taking place. Historically most of the homes in the subdivision were vacation homes. This changed during this period. Many of the homes became primary residences. Skier traffic also increased during this period. The demand and interest in skiing powder dramatically increased. All this resulted in a significant increase in traffic on the road, with an especially notable increase during storm periods. More kids playing in the road, more vehicles at all hours, more dogs, more

homeowners shoveling out their cars, more heavy snow removal equipment working in front of the homes. All these changes were taking place during a period of time when the winters and storms were not producing large avalanche events along the road.

## 6. BIG WINTERS AND NEW PROBLEMS

The winters of 1994/1995, 1995/1996 and 1996/1997 each produced storms which resulted in large and in some cases unprecedented avalanches along the road. In each of these winters structures along the road were damaged by both natural or artificially released avalanches. In one notable event over a dozen structures were damaged. During the worst of the events there were several dangerously close calls for both vehicles and pedestrians. In spite of the ski area's best efforts to control the avalanches effecting the road it became clear that the avalanche control program as designed could at best help protect the users of the road but could not protect the structures along and below the road.

Problems compounded as homeowners and insurance companies looked for someone to pay for the damage. Some homeowners questioned the adequacy of the control program. Many of them were under the impression that the control program was in place to protect not only the users of the road but also their homes. Fingers were pointed, questions were raised. Who should be responsible, the ski area, the county, the homeowners, or the property owners of the avalanche paths above the road?

Although the ski area had anticipated this possible problem for some years, the first event in 1995 solidified its desire to revisit the agreements with the other parties and redefine the limitations of the control program and the responsibilities and liabilities of the other

players. All along, the ski area had taken the position that the control program was intended to protect the road and not the structures along the road. Although the agreement with the county stated "Contractor agrees to conduct avalanche control operations as necessary to protect health, welfare and public safety on said road....", there remained many unanswered questions regarding who was responsible for the safety of the homeowners and their homes.

## 7. NEGOTIATIONS AND LAWSUITS

Over the past two years there have been many letters written, numerous meetings and much discussion between the various parties. Generally, positions have not changed and the existing documents are still in place. The ski area's basic position is it will provide avalanche forecasting and control services for a reasonable fee, the control program is only for the road and not for the structures below the road, based upon a California Supreme Court decision the property owners of the starting zones of the avalanches are legally responsible for damage to property below theirs for avalanches starting on their property and the ski area should not be the sole party to be liable and it should not be required to insure and indemnify any other parties. The county's basic position is it is not responsible for the safety of the homeowners or their homes, the fee requested by the ski area is too high, and if the ski area wants to do avalanche control for the road it will need to agree to insure and indemnify the county. The property owners of the avalanche paths take the position that if the ski area wishes to use explosives on their property it will need to insure and indemnify them. The homeowners who have seen their property values drop dramatically in the past few years are taking a variety of approaches. Many are looking to either or both the ski area and the county for a solution, one homeowner is taking an active

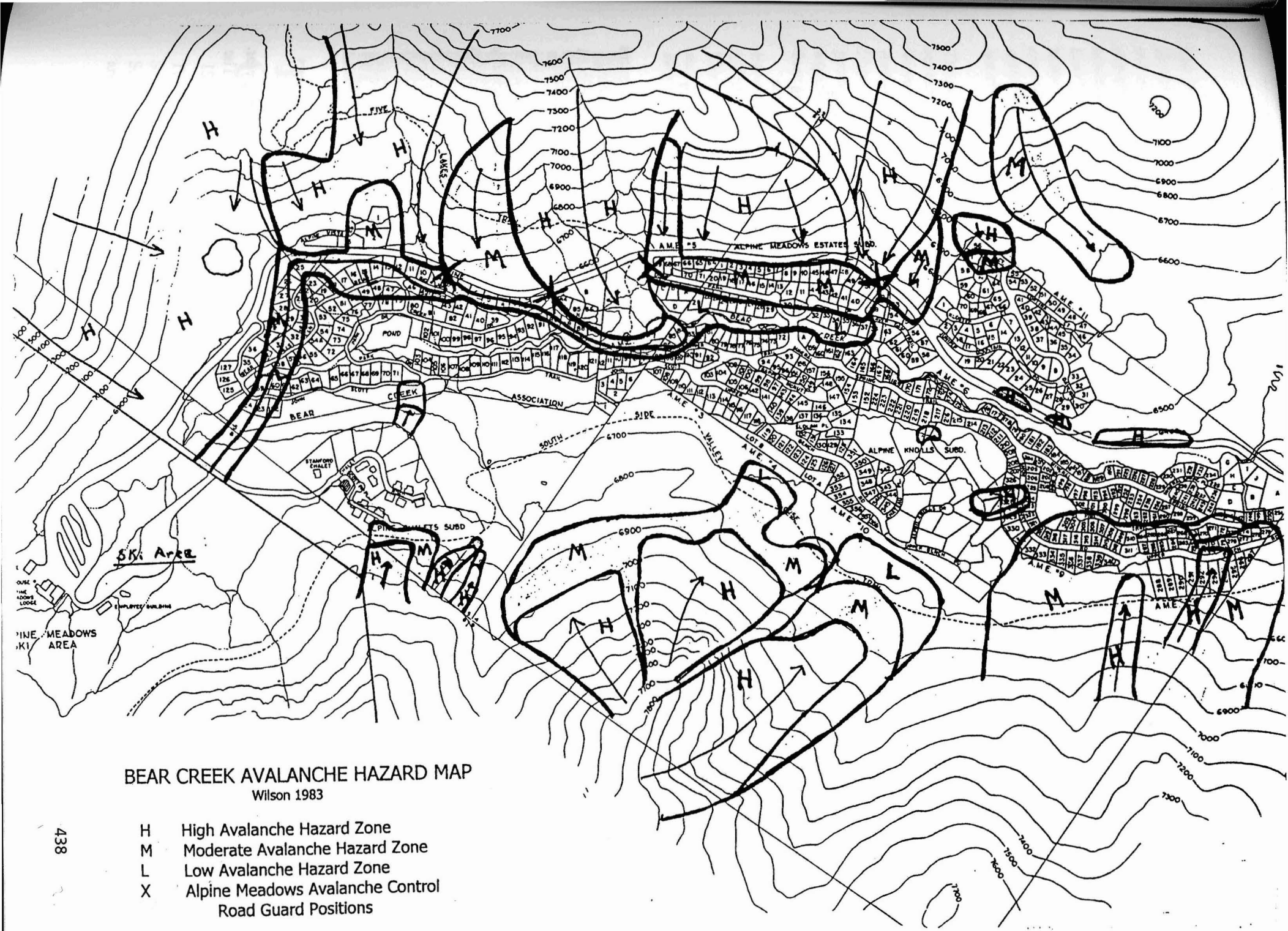
role in developing a passive control system above his home and most are hoping the big one will miss them.

Currently the situation appears to be at a stalemate. All parties agree to the necessity of keeping the road open and that closure during storm periods is not an option. It appears all parties have consulted their lawyers and are receiving conflicting advice. But things may soon be resolved in court. The insurance company for one of the homeowners whose home was recently damaged has filed suit against the ski area. In response the ski area has cross complained (sued), the homeowner, the county and the property owner of the avalanche path.

## 8. CONCLUSIONS

The issue of who is responsible does not address the more pressing problem of the safety of the homeowners and their homes. The existing control program has proven to be very effective in protecting the users of the road. In the thirty plus years the program has been in place there have been no injuries and only minor damage to vehicles traveling on the road. The recent proposal to install and test passive control structures above some of the homes may provide a partial solution.





BEAR CREEK AVALANCHE HAZARD MAP  
Wilson 1983

- H High Avalanche Hazard Zone
- M Moderate Avalanche Hazard Zone
- L Low Avalanche Hazard Zone
- X Alpine Meadows Avalanche Control Road Guard Positions