

# Alpine Meadows

## Community Wildfire Protection Plan

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Geoarch Sciences, Inc.

&

C.G. Celio & Sons Co.

*P.O. Box 734*

*Minden, Nevada 89423*



# ALPINE MEADOWS

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## **Demographic, Location, and Topography**

Alpine Meadows is located northwest of Lake Tahoe, along California State Highway 89, just outside of the Lake Tahoe Basin. It is a community of approximately 500 homes along Alpine Meadows Road, which stretches from State highway 89 to Alpine Meadows Ski Area three miles up the road. The community encompasses approximately one square mile within Placer County. The North Tahoe Fire Protection District provides fire and emergency medical services.

The Alpine Meadows area contains approximately 670 private parcels, interspersed among a few open space parcels. Bear Creek runs through the community, creating a riparian area near many of the homes. Most of the homes are constructed in the bottom of the canyon along the creek or other riparian areas.

A number of homes are permanent residents, residing in the area through summer and ski season. Industry is tourist based, or tourist supported, including summer construction near the resort or winter services. Many of the residents are seasonal or have second homes in the Alpine Meadows community.

The elevation of Alpine Meadows ranges from 6185 feet at the mouth of the canyon to 6835 feet at the lodge. Mountain peaks above the community are at 8637 feet. While wildfire is a concern in the community, winter hazards, like avalanches, have also impacted the community in the past.

The private lands are surrounded by United States Forest Service (USFS) owned lands. The Alpine Meadows Ski Area is on USFS lands and is operated under a seasonal use agreement.

## **Neighborhoods**

Within Alpine Meadows, five neighborhoods were identified for assessment. They are:

- Alpine Center
- Alpine Meadows Estates
- Bear Creek
- Juniper Mountain
- Chalet

These neighborhoods are outlined in Figure 1.







## Fire Service Overview

Alpine Meadows has historically provided volunteer fire protection services within the community, supplemented by contracted emergency services from the North Tahoe Fire Protection District (NTFPD). There are less than 100 emergency calls per year, with the majority of calls (approximately 80%) for medical services at Alpine Meadows Ski Area.

A small two bay fire station is located with the Alpine Springs County Water District (ASCWD) building at the lower end of Alpine Meadows Road



Within the last year, the number of volunteers in the fire department has

dwindled to **Alpine Meadows Fire Station**

zero. Community demographics combined with the increased required training mandates have significantly limited the number of residents who have the ability and time to be committed to the volunteer fire department. The lack of volunteers has forced the ASCWD to seek other solutions for primary fire suppression services. The volunteer fire department has been effectively disbanded and the ASCWD is seeking other solutions for emergency service.

The North Tahoe Fire Protection District assists the Alpine Meadows community with prevention activities where possible. One of their firefighters lives in the Alpine Meadows fire station in exchange for commitments of availability to the community certain times during the week. They also provide courtesy defensible space reviews for each homeowner during the summer. In addition to these reviews, the NTFPD extend their community chipper program to Alpine Meadows area. Residents can pile vegetation materials at the curb, and then call the NTFPD to request the chipping crew. Usually within a week, the NTFPD chipping crew comes to chip the material.

Squaw Valley Fire Department (part of the Squaw Valley Public Service District) also provides automatic aid services to Alpine Meadows by agreement with the NTFPD. There is no written agreement between ASCWD and the Squaw Valley Fire Department, first alarm aid is provided as part of the larger first alarm aid agreement with the NTFPD for the Truckee river corridor.



The entire water district is classified by the State of California as State Responsibility Area (SRA). This means the responsibility for prevention and suppression of wildland fires is the responsibility of the California Department of Forestry and Fire Protection (CDF). The USFS, Tahoe National Forest (TNF), Truckee Ranger District, provides these direct protection responsibilities on behalf of the State of California through an exchange of acres agreement.

Wildfire protection services are provided at the local level by the NTFPD. Through the NTFPD, Alpine Meadows is also covered by the Lake Tahoe Regional Chiefs Association mutual aid agreement, providing simplified access to Lake Tahoe Basin fire departments upon request. The NTFPD is also a signatory to the California Master Mutual Aid System. As a system participant, NTFPD has access to free firefighting resources throughout the State of California.

The NTFPD employees 36 career firefighters and 20 part-time firefighters. A majority of the firefighters are trained to the level of paramedic licensure. A five member Board of Directors with each director representing geographically distinct area governs the District. The annual operating budget is approximately \$7.2 million dollars. The District staffs three fire stations 24/7/365 with a fourth station having been converted to an apparatus repair facility. The District's fifth fire station is a resident fire station for four of the District's part-time firefighters. The District's Strategic Master Plan guides decision-making by executive staff and the Board of Directors. The Tahoe City station is closest to Alpine Meadows and is the primary station of response for Alpine Meadows requests for service. Response time from Tahoe City to Alpine Meadows is approximately 7 to 15 minutes, depending on location of the incident within Alpine Meadows. North Tahoe's system status management plan calls for backfilling the Tahoe City station immediately if resources are dispatched to an alarm. This depth of service has served Alpine's constituents well over the years ensuring prompt response 24/7/365.

All NTFPD personnel are trained to a minimum of California State Fire Marshall firefighter 1 and thereafter firefighter 2. Annual wildland firefighter training is required in conjunction with the National Wildfire Coordinating Group (NWCG) 310-1 curriculum. Captains and Chief Officers are trained and red carded with the California Incident Command Certification System to various levels including engine officer, strike team leader, and various positions on the incident management teams.

While the NTFPD currently provides adequate emergency services to Alpine Meadows, decreasing budgets and increasing call volume within their district may force their board at some point to limit commitments to communities outside their district. Alpine Meadows may want to plan for the eventuality of becoming a part of the NTFPD or another fire district, or creating their own fire protection service.

## **Water Sources and Infrastructure**

The ASCWD provides domestic and firefighting waters supplies for the neighborhoods across the Alpine Meadows community. Their offices are located at the lower end of Alpine Meadows Road. As a water district, the five-member board meets once a month to manage the operations of the district. In addition to providing water, sewer, park and garbage services, the ASCWD also has provided facilities and funding for fire services in Alpine Meadows.



Fire hydrants exist in all the neighborhoods. In addition to hydrants, multiple ponds exist along Bear Creek providing additional static water supply. The Truckee River at the lower end of the community is also an excellent water source, though easily accessible draft sites are not evident.

The abundant water supply and fire station within the community has allowed Alpine Meadows to maintain an ISO rating of 6. This is a rating established by the Insurance Services Office that many insurance companies use in determining homeowners insurance rates. The current ISO rating is based on having a fire station within the community. Should the station no longer be used it may affect the ISO rating for the neighborhoods. The lack of staffing is the single greatest impediment to a lower (and more beneficial) ISO rating.

### **Fire Call Detection and Response**

Calls to 911 are routed to the Placer County Sheriff's Office dispatch center in Tahoe City. First alarm assignments are dispatched to the NTFPD resources and Squaw Valley Fire Department resources. The USFS Tahoe National Forest (TNF) dispatcher is also notified of the call if it involves the wildland. The TNF dispatches the USFS resources from Truckee.

Dispatching of large wildland fires in Alpine Meadows is handled through the interagency dispatch center in Grass Valley. All NTFPD radio systems are compatible with mutual aid and automatic aid neighbors.

### **Community Preparedness**

The NTFPD has an active wildfire prevention program. The district distributes information to the public regarding defensible space and appropriate building materials. Through grants with the USFS, Lake Tahoe Basin Management Unit and the CDF, the district operates a curbside chipping program to provide residents with solutions for



disposing of defensible space material. Placer County is completing its countywide hazard mitigation plan, of which the NTFPD and the ASCWD are a part.

Pre fire engineering is an important element of community preparedness in the NTFPD. The district and Placer County have a number of standards and ordinances, based on California Public Resources Code 4290, in place to address community design issues regarding wildfire hazard preparedness. Ordinances specify details such as:

- Road, driveway and turnaround dimensions to provide safe ingress and egress for the public and fire suppression resources during a fire event.
- Emergency water supply for sustained firefighting operations.
- Use of flame-resistant building materials in home construction, specifically in roofing and siding materials.

In addition to the codes and ordinances for community design, the ASCWD has adopted Planned Community Development Guidelines and Conditions for subdivisions based on the codes and ordinances. The document provides developers guidelines on mitigation measures and community design guidelines for subdivision construction in the ASCWD, streamlining the approval process by illustrating approved community design elements in the ASCWD.

The ASCWD, NTFPD or Placer County should consider reviewing its codes and ordinances regarding the use of flame-resistant siding and roofing materials. While a single nonflammable standard across the NTFPD would not be publicly acceptable (due to a desire to keep building materials consistent with historic architecture), some high-risk areas within the district need to adopt a non-flammable standard for building materials.

The Alpine Meadows homeowners and their associations can also take measures to encourage the use of appropriate building materials. During the review of community structures, it was clear wood based siding materials are encouraged if not required as part of the architectural design of the neighborhoods. Wood siding fits well in the mountain village design, however provides an extremely likely place for fire and burning embers to ignite a home. Homeowners need to either replace flammable siding or treat it with a flame resistant material. The preferred and most effective option would be siding replacement.

Alternatives for non-flammable siding include vinyl, metal or concrete siding. While still susceptible to heat, vinyl siding will typically warp but not produce flame. Burning embers, which get lodged in the crevasses in wood siding, are the biggest hazards to homes during a wildfire event. Vinyl siding limits the number of spaces for embers and is more flame resistant than wood. Metal and concrete siding is obviously non-flammable and most desired for a flame-resistant building material. Manufacturers have created vinyl, metal, and especially concrete siding products that look very similar to wood, particularly at a distance. The community can still maintain the desired architectural design while using flame-resistant siding.

Replacing siding is not always an economic reality, so treatment products for wood are available to make it more flame resistant. Treatment products include materials applied directly to the wood surface and products that are mixed with paints or stains as part of the general siding maintenance process. These treatments typically do not last as long as the paint or stain and may need to be reapplied to maintain their effectiveness, as often as annually.

Many different companies make flame resistant siding and treatments for exterior wood siding. Below are some examples:

Flame Stop Inc. – [www.flamestop.com](http://www.flamestop.com) – treatments for existing wood siding  
James Hardie Siding – [www.jameshardie.com](http://www.jameshardie.com) – fiber-cement siding materials

These companies have not been reviewed as part of this report and are not specifically endorsed in this plan. A number of other companies make flame-resistant siding options, some guidance can be found at [www.doityourself.com](http://www.doityourself.com).

The objective in treating or replacing siding and roofing materials is to have building materials that meet a Class A fire rating standard. The most commonly used standard is developed by the National Fire Protection Association and has been adopted by most local governments. These ratings are recommended in some locations, mandated in others. The homeowners associations could also adopt recommendations for homeowners to use aesthetically pleasing Class A rated roofing and siding materials.

Use of Class A roofing materials appears to be widespread in the neighborhoods. Surveys found that about 40% of the structures had Class A roofs, and it appears new or replacement construction is using Class A materials.

### **Hazard Assessment**

A structural ignitibility assessment was conducted in each of the five neighborhoods in Alpine Meadows. Staff conducted the assessments in July inspecting homes, roads, and utilities in each of the communities. The assessment considered:

- Flammable building materials
- Number of unenclosed structures
- Effective defensible space
- Road width
- Turnaround diameter
- Street and address signage



<b>Community</b>	<b>Without Adequate Defensible Space</b>	<b>With Flammable Siding</b>	<b>With Unenclosed Structures</b>	<b>Overall Rating</b>
<b>Alpine Center</b>	20%	43%	46%	Moderate
<b>Alpine Meadows Estates</b>	67%	34%	47%	Moderate
<b>Bear Creek</b>	87%	47%	60%	High
<b>Juniper Mountain</b>	80%	44%	53%	High
<b>Chalet</b>	6%	18%	59%	Low

**Table 1: Hazard Assessment Results**

The results of the assessment indicate the need for improvement of defensible space and the use of non-flammable building materials. Determining adequate defensible space is subjective; the survey used stringent standards for adequate defensible space. California Public Resource Code calls for removal of flammable vegetation within 100 feet of homes. Given the close proximity of structures in Alpine Meadows, this standard would be difficult to implement, virtually all of the pine and fir trees would be removed from the area. Instead, the definition of defensible space used in this study assumed it's adequate if the continuous fuel bed between the wildland fuels and the homes was broken. Clumps of trees next to homes, continuous brush fields from homes to the wildland, and tree canopies connecting homes to homes were all examples of inadequate defensible space. Removing enough trees to break up fuel beds in these situations should not adversely affect the aesthetic qualities of the neighborhoods.

Unenclosed structures are overhangs, decks, and other coverings that could trap embers and ignite homes. Many decks are enclosed, however the large number of snow coverings for walkways and decks create a number of unenclosed structures. Removing these structures is not recommended, but enclosing them or constructing them with a minimum of areas to trap embers is necessary.

In the residential neighborhoods, defensible space is inadequate at between 67 and 87 percent of the homes. Fires could easily spread from the wildland to homes, and more likely from home to home. Thirty to sixty percent of homes have flammable siding and unenclosed structures, providing plenty of opportunities for fire and burning embers to ignite homes.

Based on the combined effects of the structural ignitability elements, overall neighborhood hazard ratings were assigned. Due to fire weather, topography, and structural ignitability, the largest fire hazards to homes are other homes. It's unlikely many homes would be destroyed in a large fire event, rather a few homes would be lost due to an ignition of one of the homes and the fire spreading quickly to others before fire suppression resources can control it.

## Forest Health, Fuels and Fire Behavior

The importance of improving forest health and the role healthy forests play in wildfire hazard reduction is crucial to properly addressing wildfire risk. The larger Community Wildfire Protection Plan for the NTFPD contains a detailed discussion of forest health and fuel loading issues around the northern Tahoe Basin. Readers should review that report for more information on fire ecology and forest processes.

Forest health is very important to the Alpine Meadows community. Like many Sierra alpine communities, the fir trees in Alpine Meadows have a fairly high mortality rate, leaving a number of dead and dying fir trees. These dead trees contribute to the wildfire fuel loadings.

Reasons for the increased mortality are typically drought and disease. Anytime there are long dry periods, the trees are stressed making them more susceptible to disease and insect infestation. The tree ultimately dies, though it may be some years after the dry spell. In crowded forest conditions, such as those that exist in Alpine Meadows,



competition amongst **Fir Mortality**

trees further exacerbates the stressed conditions. Fuels reduction treatments reduce the forest stand stocking, open the forest stand, and reduce competition between residual trees. Residual trees are more resistant to stresses from insect and diseases.

Poor forest health can lead to higher fuel loadings. Wildfire fuel loadings within the Alpine Meadows communities contain a significant amount of dead material, ladder fuels, and brush. Fire behavior in these fuel types can be difficult to control.

Fire behavior can be explained by two major elements; fire intensity (described by flame length) and rate of spread. To effectively suppress wildfires, both the flame length and rate of spread must be controllable. In areas with dense fuels, rates of spread will be low, but fire intensity (flame lengths) will be so high that suppression resources cannot get close enough to suppress it. In areas of light fuels, fire intensity can be low enough for suppression, but the fire may spread faster than suppression resources can move to catch it. In Alpine Meadows, terrain is difficult which will slow suppression resources off of a paved road.





A simple assessment of fuel models was conducted using visual inspection of sites around the communities. Fuel model 10 is most common around the Alpine Meadows Estates, Bear Creek, and Chalet neighborhoods. This is a dense forest cover with significant ladder fuels. Fire behavior in these areas can be extreme due to flame

**Fuel Model 10**

ladder fuels exist to allow ground fires to easily spread to the canopy. The heavy amount of fuel means very intense and uncontrollable fires, however rates of spread are fairly low, allowing more time for fire service resources to control ignitions. Areas that fall into the fuel model 10 are in need of treatment and should result in a reduced fuel model when treatment is complete.

length. Significant

Juniper Mountain neighborhood contains areas of fuel model 10 and fuel model 5. Some lots in the upper portion of the neighborhood are fuel model 10 and the ridge at the top of the neighborhood is a fuel model 10.

Tree density is very high with significant ladder fuels. The south-facing slope in the middle and lower portion of the neighborhood is a fuel model 5. Tree density is reduced; many trees have adequate spacing,



with a brush and grass understory.

**Fuel Model 5**

Though fuel loadings are less, fire behavior can be more dangerous due to the speed and intensity at which fire moves through this fuel type. Creating and maintaining defensible space is most effective in this fuel type.

A fuel model 9, with some well-spaced trees and limited brush understory, surrounds the Alpine Center community. The large amount of paved area and the cleared slopes protect the area from serious wildfire threats.

The various forest types in Alpine Meadows have slightly different desired conditions and therefore different desired treatment prescriptions. The areas of fuel model 5 around Juniper Mountain, with more open pine stands are best suited to a “park like” stand. Tree spacing should be fairly regular or in clumps, with large open areas to break up the fuel continuity. Brush and grass should be treated to break up the continuous fuel bed, allowing for spacing between individual brush plants. Treatments in this area should seek to keep a fairly continuous tree density over the landscape.

Areas with fuel model 10 are typically filled with fir species with dense, touching tree canopies and large amounts of ladder fuels. Fir species are shade tolerant, meaning trees do well growing in the shade of others. This allows the forest stand to become very crowded and fires or other disturbance events are commonly stand destroying. Treatments in these areas should attempt to reduce tree density and also include patches of open areas, allowing trees to grow in clumps. These clumps should not be near homes or roadways and wildfire fuels should be treated so fire can be suppressed in these areas.

### **Ignition Assessment**

Lightning is the most common ignition source. Lightning strikes are usually accompanied with rain, especially at the higher elevations in the Sierras, so the ignitions typically do not expand to wildfires.

Human ignitions are always the most hazardous. They occur during the worst fire weather conditions and can involve dangerous situations such as vehicles or homes. Vehicle accidents frequently result in fires and sometimes vehicles end up off the road. Vehicle and home fires that spread to the wildland pose the greatest ignition risk in Alpine Meadows.

### **Fire Weather and Topography**

Once an ignition expands into a wildfire, weather and topography usually dictate how devastating the fire will be. The high elevation of Alpine Meadows allow for lower temperatures and better moisture recovery during the night. Southwest winds do blow down the canyon but are not very dry. The topography of the canyon is open enough that there would not be a significant chimney effect during a fire.

The fire weather and topography risk in Alpine Meadows is low. The fire history data for the area demonstrates this point. While there are a number of ignitions in Alpine



Meadows annually, none of those ignitions have resulted in large fires in recorded time. The forest stand does not show signs of large fire events. Fire behavior is calm enough to allow suppression resources to reach it in time to control it, or the rate of spread of the fire is controllable.

#### *Overall risk*

The CDF Fire and Resource Assessment Program (FRAP) data was reviewed as part of this planning effort. It indicates the fire threat around the Alpine Meadows neighborhoods is low to moderate. The areas of highest threat are on the south facing slopes above the Juniper Mountain neighborhood.

In Alpine Meadows, the overall risk of catastrophic fire moving through the community is low. Natural events are unpredictable and the right combination of drought, fire weather, and fuels could allow an ignition to spread uncontrollably. However, the greatest risk to homes within Alpine Meadows is from neighboring homes. It is more likely that a structural fire would easily spread to one or more homes before fire suppression resources could control it.

### **Recommended Mitigation Measures**

To address the wildfire hazards in Alpine Meadows, a number of specific mitigation projects are proposed. Effective hazard mitigation requires the implementation and maintenance of all of the mitigation projects.

#### *Residents and Landowners*

Residents and private landowners are the most effective group in mitigating wildfire hazards. As such, public education is the most important element of an effective mitigation program. A couple of mitigation measures can be easily employed with the Alpine Meadows communities to assist in public education:

- Architectural Design Review committee – the Architectural Design Review committee should review its current landscape and building materials standards to determine which, if any, standards should be modified to encourage use of flame resistant landscaping and building materials. Wet riparian vegetation, such as willows and aspen, should be encouraged where possible. Building materials should incorporate nonflammable materials, such as Masonite, concrete, steel and vinyl in siding products while maintaining the desired aesthetic qualities. Check with local contractors for building material options and costs. Home address signage requirements should also be reviewed. Address signs should be reflective and contrast with the background material to which they are attached. (Note: See Placer County Ordinance)
- Information Materials Distribution – The Alpine Springs County Water District should provide at its public office counter copies of the Living with Fire in the Tahoe Basin and other handouts regarding appropriate building materials, once approved by the architectural review committee. This will provide a location in

the community for residents to obtain this information before commencing home improvement or new construction projects.

- Form a local Fire Safe Chapter- Similar to the model employed in the Tahoe Basin; a local group of homeowners' association representatives should form a Fire Safe Chapter. This organization would likely be a subset of the Placer County Fire Safe Council, and does not need any special non-profit or other formal organizational status. It should be a group of concerned citizens who can assist the ASCWD and NTFPD in fire safe activities. Both the ASCWD and NTFPD want to see progress made with wildfire safety, but have other primary missions. The group would keep informed on local, regional, and state fire safe issues, providing guidance to other homeowners' associations on grant application priorities, needs, and concerns within the neighborhoods. The group need only meet frequently enough to maintain progress on fire safe issues.

Defensible space, building materials, and home construction guidelines are designed to reduce the risk of structure loss during a wildfire to less than 1%, according to *Living with Fire in the Tahoe Basin* publication. If completely implemented, almost all structures within a community will survive a wildfire even if no community mitigation projects have been implemented. Landowners must take an active role in addressing these hazards on their property.

The results of the structural assessment conclude that most homes need to improve some component of defensible space, building materials, or home construction. California Public Resources Code 4291 (PRC 4291) requires homeowners to address wildland fire hazards through creation of defensible space and other building construction mitigation measures. Specifically, the code requires homeowners to:

- Maintain adequate defensible space 100 feet around structures.
- Remove that portion of any tree that extends within 10 feet of the outlet of any chimney or stovepipe.
- Maintain any tree adjacent to or overhanging any building free of dead or dying wood.
- Maintain the roof of any structure free of leaves, needles, or other dead vegetative growth.
- Provide and maintain at all times a screen over the outlet of every chimney or stovepipe that is attached to any fireplace, stove, or other device that burns any solid or liquid fuel. The screen shall be constructed of nonflammable material with openings of not more than one-half inch in size.

To address these issues, residents must educate themselves on the *Living with Fire in the Tahoe Basin* guidelines and review their property for needed improvements. If residents have questions regarding the information, they should contact their local fire district to review their property and provide guidance. The *Living with Fire in the Tahoe Basin* guidelines provide significant detail regarding the spacing and removal of trees and shrubs from around homes.



Recommended spacings are commonly a minimum; residents may wish to remove more vegetation where regulations allow. On vacant lots and in the defensible space zone on their properties residents and landowners should provide at least 10 feet of spacing between tree canopies, greater distances on slopes over 20%. When choosing which trees and shrubs to remove on their property, preference should be given to those individuals that are smaller and suppressed. Removal of this vegetation is less likely to require permits and leaves the more desirable trees. Maintaining defensible space is a continuous process. Each year residents and landowners should re-evaluate their property to ensure proper defensible space criteria are met.

#### *Community Fuels Projects*

The most efficient method to implement community mitigation projects is through community-based solutions. These include community chipper programs, open space treatments, and community fuels reduction projects.

At the conclusion of the report are project worksheets for each of the projects listed below. The worksheets are intended to be simple project explanation forms to assist in developing grant applications or informing agencies about the details of the project.

#### **Community Chipping Program**

The community-chipping program is currently working in the neighborhoods. It should be maintained, and if demand increases, expanded. The current situation is to have a contractor hired by the NTFPD come to the curb to chip materials piled there by the landowner. While some piles were observed, landowners clearly have much more work to do. The chipper program is an effective disposal method for these activities.

Homeowners need to continue and improve defensible space efforts as outlined in the recommendations above. The Community Chipping Program will provide a reliable disposal method. Continuing to partner with the NTFPD is recommended since there will not be enough work to employ a chipping contractor full time in Alpine Meadows.

Homeowners should create enough biomass material to keep a chipping crew in Alpine Meadows an average of two days a week for 16 weeks during the summer. At roughly \$1000 per day for a three-person crew with equipment and travel, the total cost is estimated at \$32,000.

#### **Open Space Fuels Reduction / Riparian Improvement Project**

In addition to the private lots, community property of the homeowners associations should be treated. These areas are larger than the private parcels and generally in the riparian corridor. Treatments within these open spaces should focus on reducing wildfire threat through improving forest health and restoring riparian vegetation. Currently the fuel model for many of these areas is a 10, the desired condition is a fuel model 8 or 9.

In some areas, dense clumps of conifer exist with high amounts of ladder fuels. Treatment should remove dead and down material. Suppressed and poorly formed trees should be removed next to achieve a desired spacing as outline in the *Living with Fire*

guidelines. Finally, should vegetation be needed to maintain aesthetic screening between homes, native riparian vegetation should be planted. Riparian vegetation should come from other locations within the Alpine Meadows neighborhoods where possible to guard against importing outside plants and diseases.

The prescription for treatment in the open areas is:



- Tree crowns should be at least 10 feet apart. Ground fuels should be removed to prevent ground fires from spreading to tree crowns. Forest stand density should be thinned to a basal area of 100-150 square feet per acre (meaning the amount of treed area in square feet 4.5 feet from the ground relative to an acre) with approximately a 40% canopy cover. Grouping of trees is permitted, provided the

spacing distance around the group is increase to 20 feet between tree crowns. Tree thinning should be from below, removing smaller and poorly formed trees until the desired tree spacing and residual basal area is achieved.

- Re-vegetation should occur to maintain visual screening as desired by the homeowners. Installed vegetation should be fire resistant species, such as willows or Aspen, and is preferred from within the Alpine Meadows community.

The proximity of the open space treatment area to the riparian corridor will pose some important environmental protection issues. The riparian area may be considered habitat for critical species in California, requiring environmental mitigation measures before and during treatment implementation. The project can still continue, but must be sensitive to the potential for critical species to exist. Since the treatment would call for increasing riparian vegetation, thus improving wildlife habitat, the project could be a win-win situation. Project partners on this project may include state wildlife conservation groups and regional watershed groups. They may be able to provide support and grant funding for such a project.

CDF has a private land forester assigned to the Alpine Meadows area. They can be contacted to discuss state forestry programs that might provide funding for this project. They will also likely be the lead agency to assist in environmental compliance issues

should a project take place. Finally, they can assist in refining the treatment prescription prior to implementation and marking of trees in the field. A Registered Professional Forester (RPF) may be required to help implement fuel reduction and forest health projects. The California Department of Forestry and Fire Protection (CDF) can provide lists of these individuals. CDF foresters are available for consultation regarding fuel reduction and forest health issues on private land. They can help landowners and homeowners associations obtain necessary information regarding forestry assistance programs.



The project may require the **Non-Flammable Vegetation** services of a California Register Professional Forester (RPF), a private contractor who is licensed to provide many of the same prescription and marking services as CDF. Grant applications must consider this planning element, using either CDF staff or a private RPF.

The treatment area covers approximately 345 acres and has an estimated project cost of \$862,500.

### **Juniper Mountain Fuels Reduction Project**

The Juniper Mountain neighborhood sits on a south-facing slope, with the top of the community just below the ridge of a small spur. Fuels within the community pose a threat but can be addressed with adequate defensible space measures. The fuels that back the community from the USFS land to the north are fairly dense and justify treatment.

The top of the Juniper Mountain neighborhood sits at the top of a canyon that runs northeast to the Truckee River. The canyon is fairly inaccessible and a fire within the canyon could spread uphill and threaten the Juniper Mountain neighborhood. Topography is in favor of the subdivision, but an additional treatment would provide necessary protection. Small size lots back the large USFS parcel, providing an excellent opportunity for partnering between the homeowners association and the USFS in creating an effective treatment.

The forest stand is very dense in places with significant ladder fuels. The vegetation is so thick, the USFS has allowed the mastication of brush along the dirt road between the



Juniper Mountain community and Squaw Valley ski area. The fuel model is 10 with significant ladder fuels and dead-and-down material.

Treatment here should focus on simply reducing stand density and ladder fuels close to the community. The wildland fuels should be sufficiently reduced for fire suppression personnel to safely create a fire line along the north side of the community during a fire event.



The prescription for treatment in the fuelbreak is:

- Tree crowns should be at least 10 feet apart. Ground fuels should be removed to prevent ground fires from spreading to tree crowns. Forest health would be

improved by reducing tree stocking to approximately 90 to 140 square feet per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by retaining 0-3 snags per acre (minimum size is 15 inches diameter at breast height (dbh)) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible. Grouping of trees is permitted, provided the spacing distance around the group is increase to 20 feet between tree crowns. Tree thinning should be from below, removing smaller and poorly formed trees until the desired tree spacing and residual basal area is achieved.

- Brush fields in this area should not carry a ground fire. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.

Since the majority of this treatment is on USFS lands, they will be the lead agency for environmental compliance, monitoring, and implementation. They will need support from the homeowners association to move this project up on their priority list at the District and Forest level. Their crews will handle planning, marking, and treatment within the project area.

For this project to be effective, the homeowners adjacent to the treatment area must implement their defensible space measures. The treatment will then extend from the USFS wildland, into the Juniper Mountain neighborhood.

The project covers 162 acres and has an estimated cost of \$243,000

### **Alpine / Bear Forest Improvement Project**

The Alpine / Bear Forest Improvement project is intended to treat areas of undeveloped fir stands with homes on both uphill and downhill of the stand. A fire, started in the downhill structures, could spread into the stand and burn quickly uphill through untreated areas, threatening homes.



This situation occurs in two areas; between Bear Creek neighborhood and Chalet, and within the Alpine Meadows Estates neighborhood. In both cases the treatment and desired outcomes are the same.

An important element to this project is the forest improvement component. Like the open space, the desire for screening between the homes lessens the

desire to remove vegetation. Unlike the open space riparian areas, there is less water so stressed trees have succumbed to insects and disease. A large amount of dead material, both down and standing, provides a significant fuel bed for spreading wildfire. The resulting forest stand after treatment will be more wildfire resistant and aesthetically pleasing.

Treatment here should focus on simply reducing stand density and ladder fuels within the community. The wildland fuels should be sufficiently reduced to slow the spread and intensity of fire during a fire event. The objective is to reduce fire intensity within the stands. Reduced fire intensity will increase the effectiveness of the defensible space measures installed by the homeowners who live on the edge of these forested areas.

The prescription for treatment in the forest improvement area is:

- Tree crowns should be at least 10 feet apart. Ground fuels should be removed to prevent ground fires from spreading to tree crowns. Forest health would be

improved by reducing tree stocking to approximately 90 to 140 square feet per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by retaining 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible. Grouping of trees is permitted, provided the spacing distance around the group is increase to 20 feet between tree crowns. Tree thinning should be from below, removing smaller and poorly formed trees until the desired tree spacing and residual basal area is achieved.

- Brush fields in this area should not carry a ground fire. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.

This treatment occurs on private land of a few large landowners. Those landowners can be informed of the project and if willing, work with the Placer County Fire Safe Council, CDF, the ASCWD, or the NTFPD to obtain financial assistance in implementing the treatment. The landowners may have other development plans for the area that would affect this project.

For this project to be effective, the homeowners adjacent to the treatment area must implement their defensible space measures.

The project covers 738 acres and has an estimated cost of \$1,107,000

### Summary of Mitigation Projects

Priority	Project	Acres	Estimated Cost
1	Community Chipping Program		\$32,000
2	Open Space Treatment	345	\$862,000
3	Juniper Mountain Fuels Reduction	162	\$243,000
4	Alpine / Bear Forest Improvement	738	\$1,107,000

**Table 2: Summary of Projects**



## Risk/Hazard Identification and Mitigation Project Worksheet

**Fire District:** North Tahoe Fire Protection District

**Name of Neighborhood:** Alpine Meadows

**Date:** October 2005

**Project Title:** Open Space Treatment

**Description of Risk/Hazard:** Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a National Forest Fire Laboratory (NFFL) fuel model 10. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely. Significant dead material and ladder fuels exist to carry a fire into the canopy.*

***Tactical Decision for Project:** The treatment was selected to protect homes from a fire that initiates in the open space. Treatment should also limit the spread of wildfire from a structure ignition bordering the open space. The project provides protection inside the community from spotting firebrands. The project is located in open space lots inside the neighborhood*

**Priority Ranking:** What is the priority ranking of this risk/hazard in relation to all others identified?

*Two*

**Location:** Describe or attach a map with sufficient detail to allow accurate ground location.

*The project is located on open space lots in the Alpine Meadows Estates and Bear Creek neighborhoods in Alpine Meadows.*

**Recommended Mitigation Measures and Scope of Work:** Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

***Open Space***

*Tree crowns should be at least 10 feet apart. Ground fuels should be removed to prevent ground fires from spreading to tree crowns. Forest stand density should be thinned to a basal area of 100-150 square feet per acre with approximately a 40% canopy cover. Grouping of trees is permitted, provided the spacing distance around the group is increase to 20 feet between tree crowns. Tree thinning should be from below, removing smaller and poorly formed trees until the desired tree spacing and residual basal area is achieved.*

*Revegetation should occur to maintain visual screening as desired by the homeowners. Installed vegetation should be fire resistant species, such as willows or Aspen, and is preferred from within the Alpine Meadows community.*

*The prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.*

***Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 10 to 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

**Identification of Protected Species or Other Critical Resources:** Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

*The project contains sensitive areas, including a riparian zone. Mechanical operations can be limited to the exiting road network within the project area. Hand crews can move material to the roadway for processing.*

*The Lahontan Regional Water Quality Control Board requires buffers for forestry activities near riparian zones. Tree removal may be allowed within stream corridors under certain conditions if it is demonstrated that removal of the vegetation will benefit the riparian vegetative community. Lodgepole and fir removal generally falls into this category. Contact these agencies to discuss treatment options within riparian areas.*

*Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.*

*With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.*

**Estimated Cost:** Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

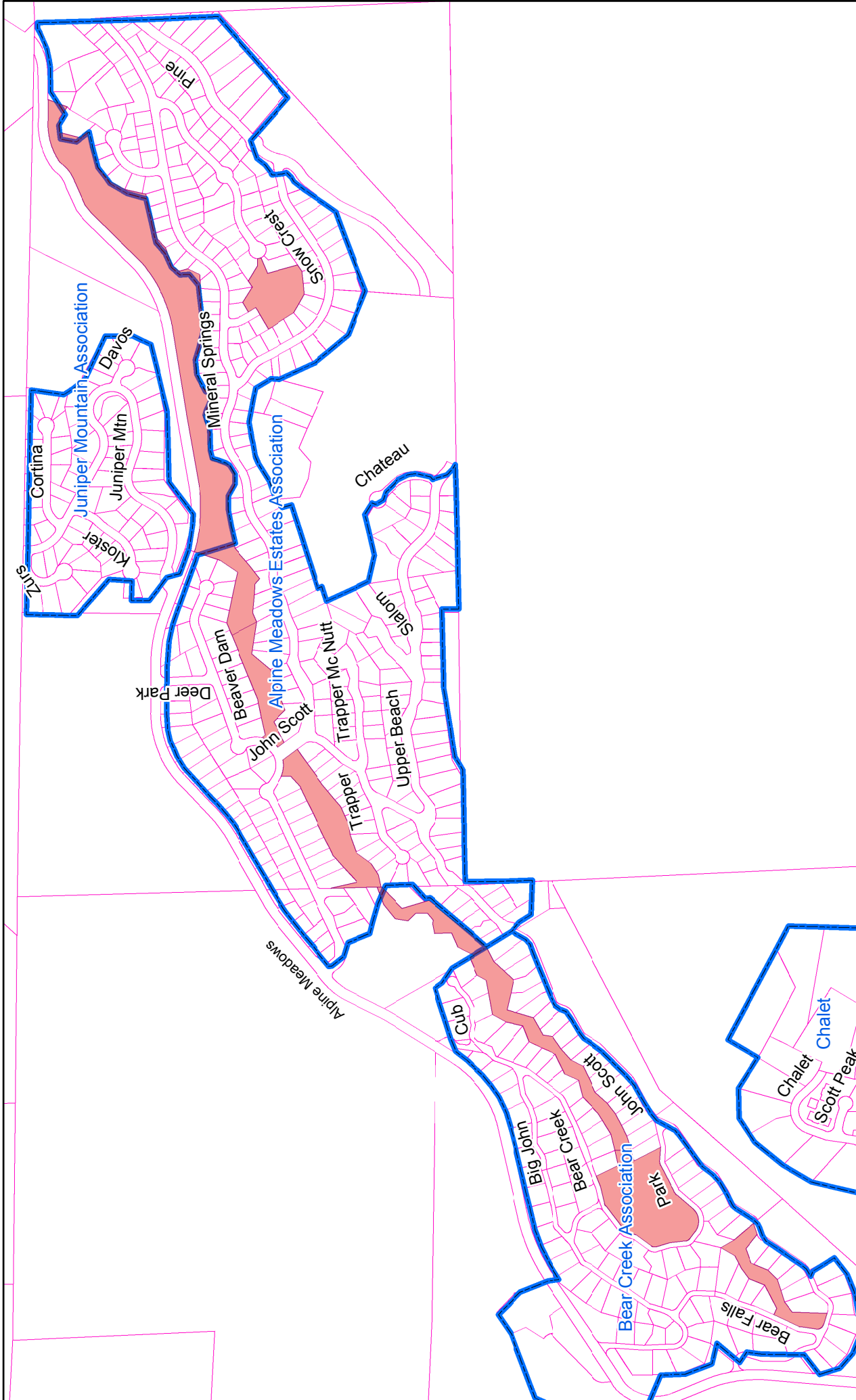
*Open Space \$2,500 per acre  
\$2,500 x 375 acres = \$862,500*                      **Total = \$862,500**

**Project Maintenance Requirements:**

*Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.*

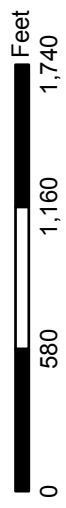
**Other Considerations:** Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

*All proposed projects must comply with federal, state, and regional environmental regulations. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with CDF and Lahontan Regional Water Quality Control Board requirements.*



**Legend**

- Neighborhood Boundary
- Parcel
- Treatment Area



## Open Space Treatment Project





## Risk/Hazard Identification and Mitigation Project Worksheet

**Fire District:** North Tahoe Fire Protection District

**Name of Neighborhood:** Alpine Meadows

Date: October 2005

**Project Title:** Juniper Mountain Fuels Reduction

**Description of Risk/Hazard:** Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a National Forest Fire Laboratory (NFFL) fuel model 10. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical Decision for Project:** The treatment was selected to protect homes from a fire that initiates in the USFS lands on the other side of the ridge. Treatment should also limit the spread of wildfire from a structure ignition bordering the open space. The project provides protection inside the community from spotting firebrands. The project is located on USFS lands north of the neighborhood*

**Priority Ranking:** What is the priority ranking of this risk/hazard in relation to all others identified?

*Three*

**Location:** Describe or attach a map with sufficient detail to allow accurate ground location.

*The project is located on USFS lands north of the Juniper Mountain neighborhood in Alpine Meadows*

**Recommended Mitigation Measures and Scope of Work:** Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

**Fuelbreak**

*Tree crowns should be at least 10 feet apart. Ground fuels should be removed to prevent ground fires from spreading to tree crowns. Forest health would be improved by reducing tree stocking to approximately 90 to 140 square feet per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by retaining 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible. Grouping of trees is permitted, provided the spacing distance around the group is increase to 20 feet between tree crowns. Tree thinning should be from below, removing smaller and poorly formed trees until the desired tree spacing and residual basal area is achieved.*

*Brush fields in this area should not carry a ground fire. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

*The prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.*

***Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 10 to 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

**Identification of Protected Species or Other Critical Resources:** Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

*Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.*

*With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.*

**Estimated Cost:** Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Fuel Break at \$1,500 per acre  
\$1,500 x 162 acres = \$243,000*

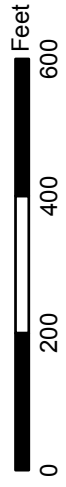
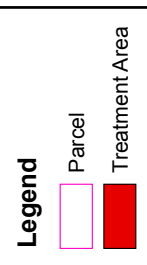
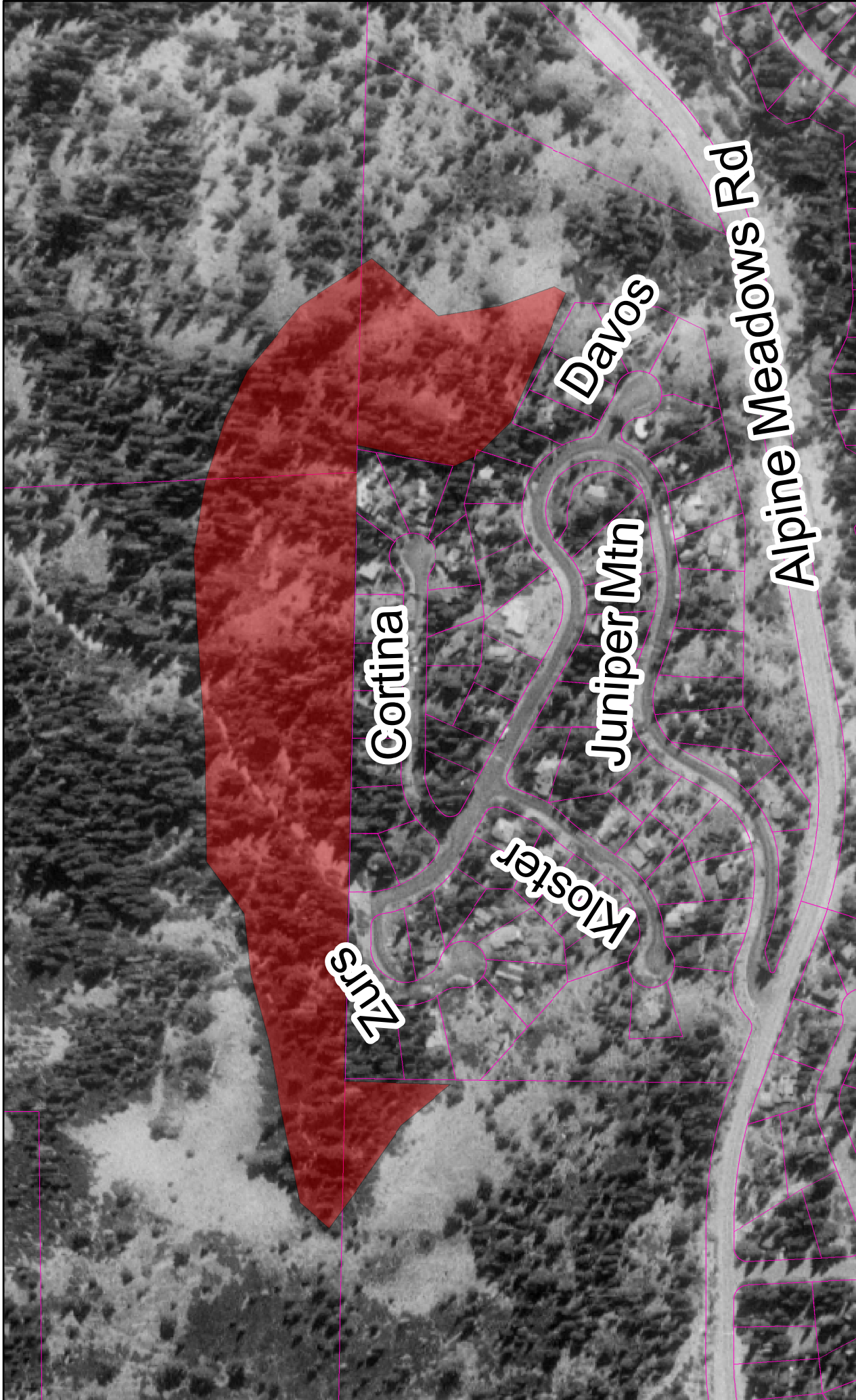
***Total = \$243,000***

**Project Maintenance Requirements:**

*Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.*

**Other Considerations:** Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

*All proposed projects must comply with federal, state, and regional environmental regulations. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with CDF and Lahontan Regional Water Quality Control Board requirements.*



### Juniper Mountain Fuels Reduction Project





## Risk/Hazard Identification and Mitigation Project Worksheet

**Fire District:** North Tahoe Fire Protection District

**Name of Neighborhood:** Alpine Meadows

Date: October 2005

**Project Title:** Alpine / Bear Forest Improvement

**Description of Risk/Hazard:** Describe in detail the risk or hazard that poses a threat to the community.

***Pre-project Fire Behavior:** The project area is a National Forest Fire Laboratory (NFFL) fuel model 10. The type of fire would be a high intensity surface fire due to heavy fuel loading on the surface and dense ladder fuels. A passive crown fire is likely.*

***Tactical Decision for Project:** The treatment was selected to protect homes from a fire that initiates in the homes below the treatment area. A fire in the treatment area would spread uphill to threaten homes above. The project provides protection inside the community from spotting firebrands.*

**Priority Ranking:** What is the priority ranking of this risk/hazard in relation to all others identified?

*Four*

**Location:** Describe or attach a map with sufficient detail to allow accurate ground location.

*The project is located on private land around the Alpine Meadows Estates and Bear Creek neighborhoods in Alpine Meadows*

**Recommended Mitigation Measures and Scope of Work:** Present prescription and work specifications in sufficient detail to facilitate procurement of bids and quotes. For hazardous fuel removal projects include estimated volumes (tons/acre) of fuel removed and disposal plan.

### **Forest Improvement**

*Tree crowns should be at least 10 feet apart. Ground fuels should be removed to prevent ground fires from spreading to tree crowns. Forest health would be improved by reducing tree stocking to approximately 90 to 140 square feet per acre. This will reduce competition among residual trees and mortality associated with insect and diseases. Maintain wildlife habitat components by retaining 0-3 snags per acre (minimum size is 15 inches dbh) and 0-3 large downed logs per acre (minimum size 14 inches dbh and 20 feet long), where possible. Grouping of trees is permitted, provided the spacing distance around the group is increase to 20 feet between tree crowns. Tree thinning should be from below, removing smaller and poorly formed trees until the desired tree spacing and residual basal area is achieved.*

*Brush fields in this area should not carry a ground fire. Spacing between shrubs should be at least twice the height of the shrubs, with residual shrubs creating a mosaic pattern of shrubs and open space across the defense zone.*

*The prescriptions are accomplished through a specific combination of thinning with either pile burning or chipping as the disposal method. Implementation of the prescriptions is unique given the proximity to structures and the relatively easy access to the forest stand. Though hand thinning has been the favored treatment technique, mechanical thinning with small machines should be evaluated as an alternative cost-effective method of treating urban fuels.*

***Prescription.** Reduce the potential for crown fires by increasing the crown base height to at least 10 to 20 feet. Starting with the smallest diameter class and remove suppressed and intermediate trees to achieve the prescribed crown base height. Remove ground fuels greater than three inches diameter and treat shrub densities to achieve flame lengths of no more than two feet.*

**Identification of Protected Species or Other Critical Resources:** Describe any measures that must be taken to protect critical wildlife habitat, historic or culturally sensitive sites, artifacts or other resources, and plant and animal species protected by statute.

*Other wildlife habitat, sensitive vegetation, critical species, and cultural resources may be present in the project area and require mitigation measures. Current wildlife habitat noise abatement measures may limit operations to a small window in the late summer and early fall. Project planning should include implementation of surveys and mitigation measures as dictated by regulatory statutes.*

*With all environmentally sensitive areas, identification and mitigation of potentially negative impacts is required.*

**Estimated Cost:** Present an estimate of the total cost of project completion and the basis for the estimate presented. If the project can be subdivided into phases or various components present an estimated cost for each.

*Fuel Break at \$1,500 per acre  
\$1,500 x 738 acres = \$1,107,000                      **Total = \$1,107,000***

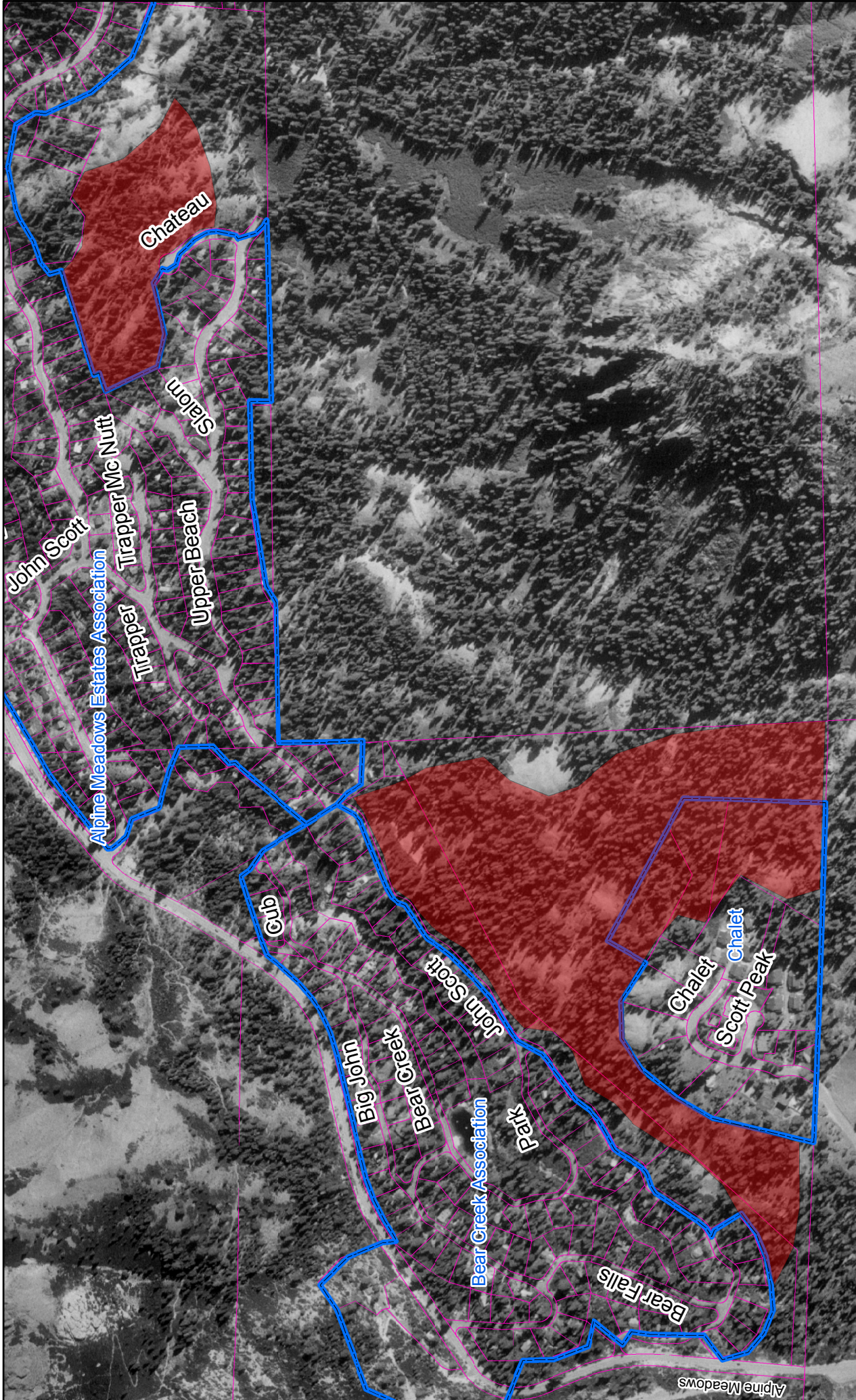
**Project Maintenance Requirements:**

*Re-thin the forest stand at 15-20 year intervals to maintain the appropriate tree density. Tree spacing and desired residual basal area should dictate when the stand is re-thinned. Brush and understory fuels should be treated with prescribed fire every 5 – 7 years to remove ladder fuels and keep surface fuels at appropriate densities for desired fire behavior.*

**Other Considerations:** Describe any other consideration that must be taken into account to successfully complete this project such as permits, clearances, approvals, etc.

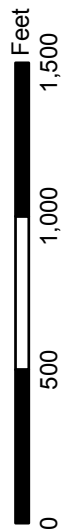
*All proposed projects must comply with federal, state, and regional environmental regulations. Projects on private land and most state lands must comply with the California Environmental Quality Act or a functional equivalent (e.g. Forest Practice Act). All projects will require compliance with CDF and Lahontan Regional Water Quality Control Board requirements.*





**Legend**

- Neighborhood Boundary
- Parcel
- Treatment Area



## Alpine / Bear Forest Improvement Project



Geoarch Sciences has made every effort to accurately compile the information depicted this map, but cannot warrant the reliability or completeness of the source data.



## **Evacuation Plan**

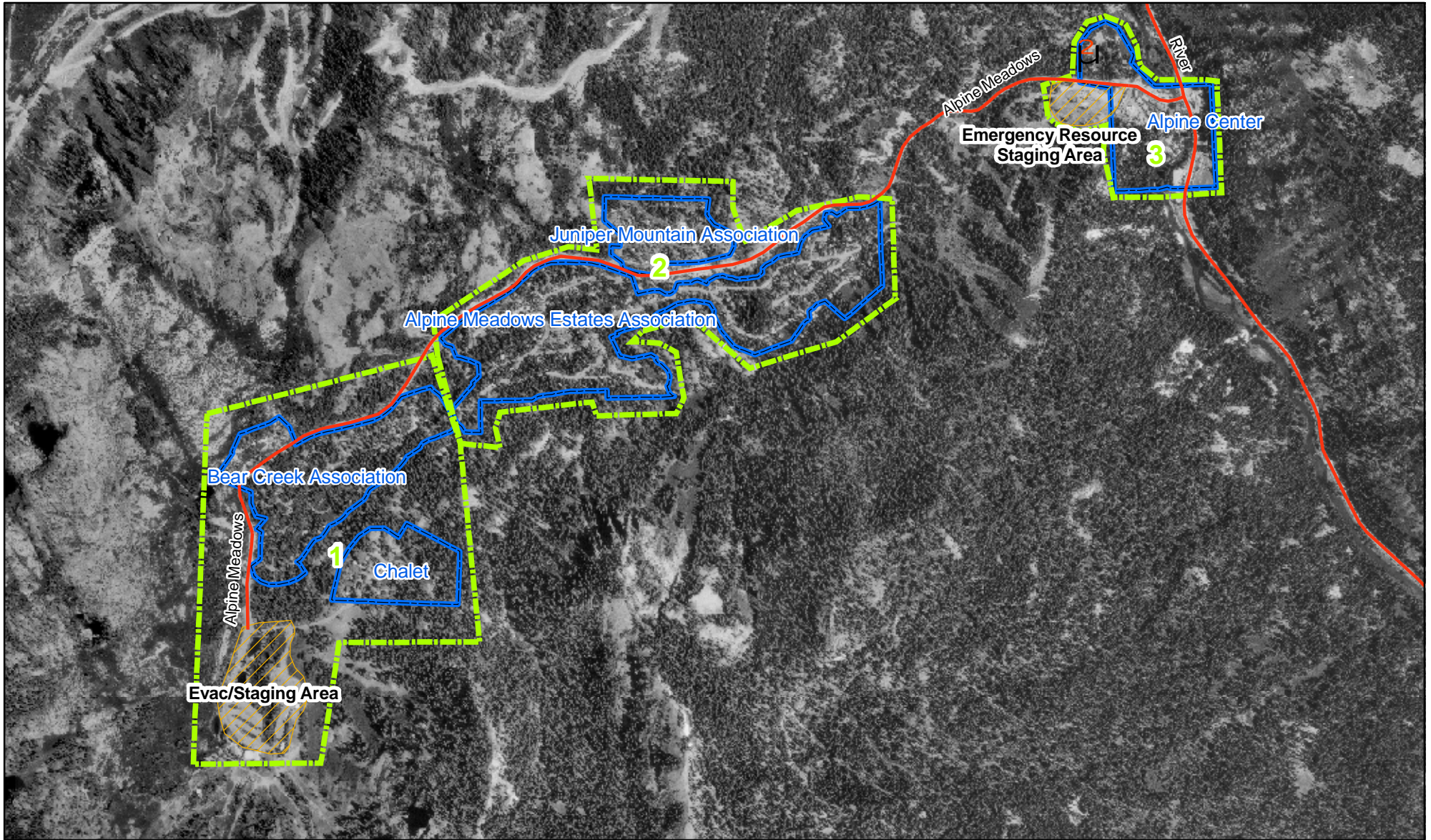
Some wildfire events necessitate evacuations of communities for life safety. Evacuations can be very dangerous events if not properly coordinated and if evacuees are not properly educated about evacuation procedures. Many wildfire-related deaths have occurred when victims were trapped by fire in their vehicles while trying to escape on narrow community roads.

North Tahoe Fire Protection District's desired alternative is that all homes within the community have effective defensible space allowing residents to shelter in place during a fire event. In addition to being trapped by fire on roadways, evacuees pose a number of threats to themselves and firefighters. Poor visibility and roads crowded with residents vehicles and fire apparatus slows both the evacuation and the fire service response. Residents staying safe in their homes allow fire fighters to respond faster and focus on mitigating the fire threat.






Should an evacuation be necessary, the local law enforcement agencies will give the evacuation signal. Deputies with loudspeakers will patrol the community advising the residents to leave. Residents may also receive an automated telephone message from Placer County via the County's "Teleminder" System advising of evacuation and the situation.

The large parking lots at the Alpine Meadows Ski Area at the upper end of Alpine Meadows Road have been designated as an area of refuge for the public during an evacuation. The parking lots provide large open areas free of flammable vegetation and are surrounded by wet, alpine vegetation. Lodge facilities can be used to house and feed a number of residents for the duration of the fire event. Residents should proceed to the parking areas and wait for instruction from law enforcement or fire personnel.

Attached is an evacuation map set for the Alpine Meadows community. Arrows on the roads in the community illustrate a recommended route out of the neighborhood to Alpine Meadows Road. Assuming the fire threat is down canyon of them, evacuees should proceed to the public refuge area at the ski resort. If the fire threat is up canyon, evacuees should proceed down to California State Highway 89, then right to Tahoe City or left to Truckee. No left hand turns should be allowed on internal streets during an evacuation until evacuees reach Alpine Meadows Road or California State Highway 89.

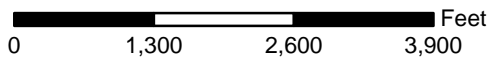


**Legend**

-  Fire Station
-  Main Evacuation Route
-  Staging Area
-  Neighborhood Boundary
-  Evacuation Map Number

## Alpine Meadows

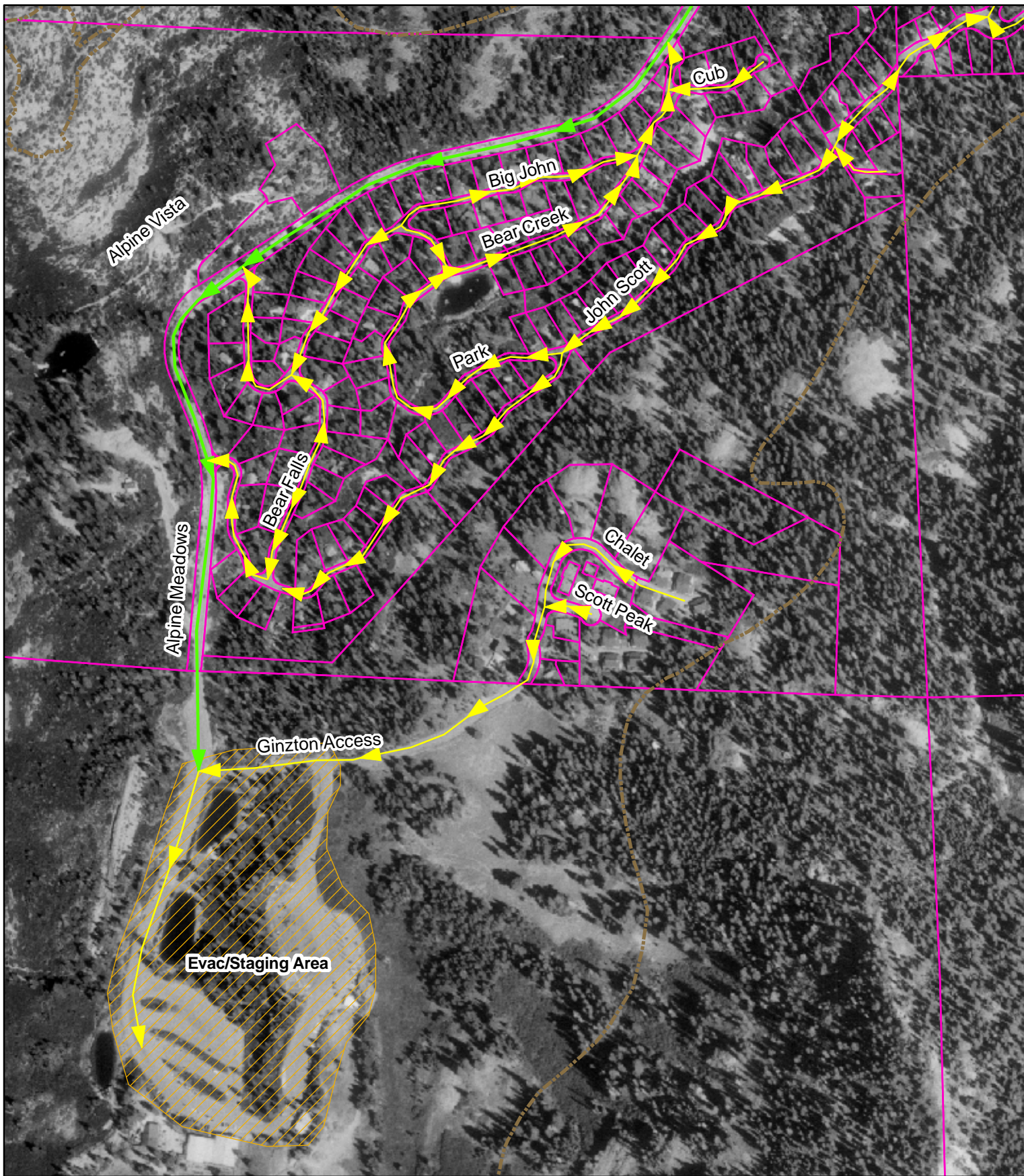
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Geoarch Sciences has made every effort to accurately compile the information depicted this map, but cannot warrant the reliability or completeness of the source data.





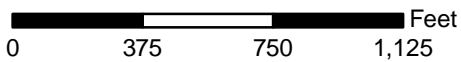


**Alpine Meadows Evacuation Map 1**

**Legend**

- Parcel
- Trail
- Main Evacuation Route
- Evacuation Route
- Evac/Staging Area

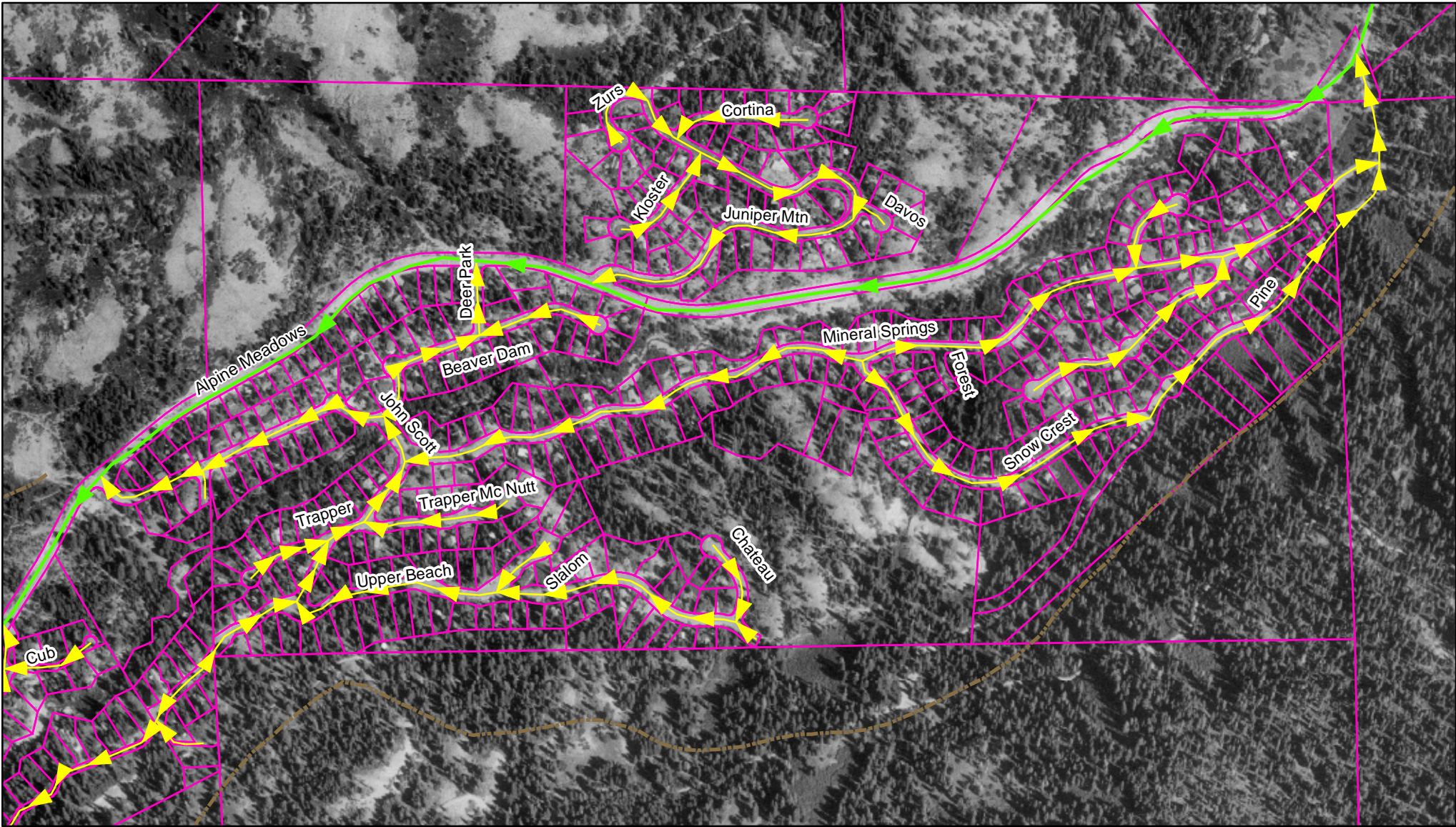
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Geoarch Sciences has made every effort to accurately compile the information depicted this map, but cannot warrant the reliability or completeness of the source data.





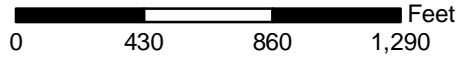


**Alpine Meadows Evacuation Map 2**

**4**

**Legend**

- Parcel
- Trail
- Main Evacuation Route
- Evacuation Route



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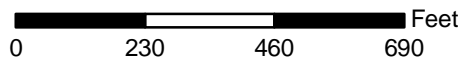


**Alpine Meadows Evacuation Map 3**

**4**

**Legend**

-  Parcel
-  Main Evacuation Route
-  Emergency Resource Staging Area



Geoarch Sciences has made every effort to accurately compile the information depicted this map, but cannot warrant the reliability or completeness of the source data.

