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**Browsing Academy**

**FIRE, FUEL LOAD REDUCTION,  
FUEL DISCONTINUITY and  
FIREBREAKING with MEAT GOATS**

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California has the climate for fires - hot dry summers and wet moderate winters. There are various tools that can be used to minimize the damage done by fire to grasslands, rangelands, forests, homes and personal property. These tools include: mechanical (bulldozers, masticator machines), hand cleaning (weed eaters, chainsaws), wildfire landscape design, herbicides (labeled for forbes/shrubs/woody species), prescribed burns and livestock (sheep, goats, cattle, horses, deer, etc.). Each tool has a specific use and place in management. A vegetative survey analysis is done, and an assessment made for the use of each tool. Holistically, the tool chosen is environmentally, economically and socially sound.

Fire protection and mitigation is a factor that should be built into the management plan of ranches, farms (crop, stock, trees), subdivisions and secluded homesites but particularly the urban/wildland interface. This interface (the I-Zone in California) should be a policy for zoning and the establishment of subdivisions. Self-help, neighborhood teamwork and an understanding of nature make fire mitigation approachable. The consequences of fire; erosion, floods, biological devastation (vegetative, wildlife) should be curtailed instead of accepted as the outcome of fire. There are excellent references addressing each of the above, written by authors that live and work in the State of California.

Fire prevention (and minimizing the damage) encompasses selecting the correct homesite, zoning ordinances that are respected, landscape planning and design with mixed plant species, fuel discontinuity, fuel load reduction and firebreaking. All approaches must take into consideration climate, topography (slope, soil, elevation), vegetation (drought tolerant plants, plants adapted to fire and plants that can be managed to minimize fire travel) and fire frequency in the area.

Goats are only one in many management scenarios that can be used to curtail the devastating loss created by fire. Our breed of choice is the KIKO meat goat, developed for survivability under harsh environmental conditions and growth rate with minimal supplementation.

### **Fuel Load Reduction**

Fuel load reduction references a reduction and lowering of ladder fuels (through pruning) and minimizing down material (through removal or mulching). Ladder fuel is vegetation growing under (understory, basal canopy) or in stands of trees that will ignite, travel up the tree and crown fire. Crown fires can generate their own "weather" and consume thousands of acres. They are extremely difficult for fire suppression teams to contain. The reduction of down material can be accomplished by removing "snags" out of standing timber,

firewood cutting of downed trees, the physical removal of downed trees or the use of livestock to break down and mulch-in slash material.

Goats used for fuel load reduction are managed to remove dense understory (brush, shrubs, forbs) and lower branches to prevent "laddering". This technique takes time and time relates to the biological control of reduction and returning to sites being reduced. On occasion, it can mean the supplementation of protein or energy for the goats (depending upon the class of goat used and time of year). A free choice loose chelated mineral mix needs to be available. It is balanced based upon profiles of soil, vegetation and livestock analyses. Depending upon the vegetation, young tree plantations or older plantations, the management can be over several years.

Eliminating the ladder fuel gradually prevents soil erosion, and enhances rainfall infiltration. All management is planned, monitored, and replanned. As the goats work through an area, they are also working the understory - old pine needles and leaves, breaking lower branches and splitting apart old downed branch material. The process is done slowly to avoid the need of erosion containment. This helps precipitation to infiltrate more rapidly and evenly and percolate through the soil interface.

### **Fuel Discontinuity**

This management approach of fuels breaks the continuity of flammable cover. The spacial distance of canopy cover between trees and shrubs is managed to help keep a potential fire low and non-crowning. The reduction (and/or removal) of the lower growing species (shrubs/forbs/grasses) can also be pursued. This vegetation can be managed to maintain a low profile, controllable so that backfiring is easier, or kept in a growth phase enhancing a higher water holding capacity within the plant. Once an area has been brushed by the goats, it can be maintained to be a "living" green belt.

### **Fire-breaking**

Management of vegetation in an area to establish a firebreak is intensive both on the vegetation and livestock phases. In a fire break regime, the goal is to prevent a fire from going any further - not to cross or jump the break-line; a controllable situation. This technique requires an understanding of fire behavior to determine where the breaks need to be established.

An assessment takes into consideration an evaluation of fuel flammability, heat intensity and duration, ignition temperatures (airflow and rate of heating), heat of ignition (fuel size distribution, live:dead material ratio, moisture content of fuel) and heat transfer (interaction with topography). For example, tunnels and chimneys in canyon or saddle areas need completely different types of firebreaks than grass or rangelands.

With the goats, the goal is to slow the oncoming fire down, decrease the intensity and allow a fire crew access to an area so they can successfully contain a fire. A good fire break will help the "mop-up crew" coming in after a fire has passed.

After the "mop-up" crew, a fire site analysis has to be completed, erosion containment planned, reseeding, replanting, wildlife habitat re-established, water quality and stream health assessed and completed.

Fire creates an endless list of "happenings" with home and personal properties being each of our major concerns. The most dramatic is the life threatening outcome of a fire - for our families/livestock and the fire "crews" that work on all aspects of a fire.

Utilization of goats as a tool to assist in "fire prevention, mitigation and/or control" is not an overnight remedy. Proper planning, site evaluation and "working goats" takes time.

Pursuing "fire control/containment" with goats (or other livestock species) takes coordination (teamwork) from many sources; stock owner, land steward, local fire patrol, professional fire abatement teams, local Fire Safe Councils, California Department of Forestry, California Department of Fish and Game, US Forest Service and the list goes on.

There is no published cost list(s) available as rate/acre, rate/head, rate/project, or rate/site for vegetation control management. Each contract is individually written and negotiated. All factors that go into a profit model, including opportunity costing, are analyzed, and gross margin (a measure of profitability) is calculated. Know the efficiency of your management, know the costs incurred when other methods of vegetation removal are used, evaluate the environmental benefits....the list has to be complete when bidding a project.

#### **READER'S RESOURCE LIST:**

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