

# CONTROLLING FRENCH BROOM

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French broom is native to the Mediterranean area of Europe. It was probably introduced to California in the mid 1800's, and is now one of the most pervasive and destructive invasive plant species in many parts of the state. Although French broom has a small root system which lends itself to manual removal, its long seed life, ability to quickly colonize disturbed areas and form dense stands, adaptability to a wide range of habitats and conditions, and long seed life can make it a difficult task to completely eradicate.

## THINGS TO KNOW BEFORE YOU START:

**Eliminating French broom is a long term project.** An established stand of French broom can have a seed bank that may persist for decades. The spring following initial removal of standing broom typically produces heavy crops of seedlings, sometimes in successive waves after periods of rain. Although many of these seedlings die from self competition, enough will survive to quickly re-establish the population if not addressed. Given enough light, those new seedlings will themselves produce seed in their second year. So unless you are prepared to do regular and thorough follow-up for many years to come, broom will likely dominate the site again.

**Eliminating French broom requires the complete prevention of seed production once control efforts have begun.** Although there is no definitive data as yet, my records and those of others show that broom seeds can remain viable in the soil for over 25 years, and it may be much more than that. So any plants which are missed and produce seed in any given year could prolong complete eradication by decades. Seed typically becomes viable in late June. If removal of plants cannot be completed by that time, seed pods should be manually collected if feasible

As broom presence declines on sites as a result of control efforts, native vegetation begins to re-establish itself on the site. However, it becomes more difficult as years pass to ensure that no broom plants are overlooked in follow-up efforts, as native species increasingly block visual and physical access to emerging broom before it sets seed.

## STEP 1: ASSESS THE SCOPE OF WORK REQUIRED.

Much can be learned by "reading" the site conditions where broom is present. Disturbance history of the site, available light, soil type and plant communities present all contribute to understanding how much work will be needed. Broom colonizes readily along roadsides and other disturbed areas with minimal competition from native plants, but once established, broom can move into adjacent intact habitat. It prefers sandy soils, and usually spreads more quickly when they are present. However, sandy soils greatly facilitate broom removal.

In sunny sites, broom grows fast, producing thick bushy growth with large trunks and many densely foliated lateral branches. Sunny sites must be worked every year to prevent seed production. Sites where there is little competition from larger plants will usually require long term effort to completely exhaust the seed bank.

Where light is limited, as on steep North slopes or where tree canopy or other shading is sufficiently dense, the broom will be tall with very thin stems and few leaves. Plants can remain alive for many years in this condition, but growth slows dramatically as light is reduced. Eventually light will be insufficient for broom to produce flowers or seed. When this point is reached, removing the standing broom may still produce some new seedlings, but they may never achieve reproduction potential, or simply die.

However, if light increases due to shade producing trees dying or being removed, broom will quickly revitalize, and may appear in new places, if broom had been there in the past. In addition, broom seeds can be spread by ants, and by clinging to the shoes of humans, tires, and animal hooves. Birds may also disseminate broom seeds, but their contribution is poorly understood. So areas which have broom populations must be continually monitored. I have many new broom sites appearing from long dormant seed banks on previously shady sites where the existing Monterey Pine canopy is disappearing, due to pitch canker.

Due to slower growth and lower flower production, shady sites can often be worked every other year with little chance of seeds being produced.

## **STEP 2: INITIAL REMOVAL OF EXISTING BROOM STANDS.**

If a broom infestation has been present for more than 4 or 5 years, it is essential to remove all live or dead broom plants to facilitate follow-up efforts, which will be needed for many years to come. For this reason, I do not advocate the use of herbicides at this initial stage. Roots on large plants take 2 -3 years to loosen their grip after dying, so removing dead plants later is almost as much work as removing live plants. Unless the site will be burned, fallen tree limbs and other debris which inhibit access to emerging seedlings should also be removed.

The following methods for the initial removal of standing broom are presented in their usual order of preference. However, the scale of the project, funding, topography, and amount and kind of available labor will be pivotal factors in determining appropriate methods.

**FIRE:** If it is possible, and adequate control measures are in place, burning is by far the fastest way to remove a large stand of broom and prepare the site for follow-up work. If the standing broom is cut and spread over the site and allowed to dry thoroughly before burning, the fire may be hot enough to stimulate the broom seed bank to produce a larger crop of seedlings the following year, especially if supplemented by flammable fuels such as woody debris, etc. Repeated burnings over the next few years can result in a significant depletion of the seed bank.

**MECHANIZED EQUIPMENT:** For very large stands of broom and where site conditions are conducive, mechanized equipment may be the best option if available, both in terms of time and cost. Specialized machines are now used for removing brushy vegetation by habitat restoration contractors. Small track laying skid-steer loaders and excavators are available in rental yards, and can be effective when fitted with a 4-in-1, or combination bucket which opens in the middle. Track layers do much less damage to the land than wheel machines, and they can work in steeper terrain (up to 30 –35% slope) But all heavy equipment can damage sensitive habitat, so operator skill and sensitivity to site requirements must be ascertained.

**HAND PULLING:** Tools like the Weed Wrench™ and the Extractigator™ have made this work much easier, and pulling is now much more effective for large stands than is widely perceived. Although French broom plants less than about ½” in diameter usually pull quite easily by hand when soil is moist in all but heavy clay soils, pulling is still labor intensive. Pulling does have the advantage of being quite economical if a volunteer force is available. The work is satisfying, as a great deal of visible progress is made in a short time.

Plants should be stacked in piles where they can either be burned later, or left for habitat, where they will quickly be occupied by an amazing variety of life.

### **STEP 3: EARLY FOLLOW-UP WORK – the next few years.**

Following removal of initial stands of mature broom, the much denser crop of seedlings which typically emerges for 3-6 years can be removed by one or more of these methods: During this time and beyond, the number of seedlings coming up in any given year may vary widely.

**SCARIFYING**, if the soil is loose and/or a sufficient duff layer is present, and done when plants are less than 3-4” tall. The surface of the soil is quickly scraped just along the surface, cutting or unearthing small seedlings. The flat edge of a McCloud is the most effective tool for this in large areas. Hoes can be used effectively in small sites or where dense native vegetation is present. Only light scraping is required, as tender seedlings succumb easily at this growth stage. This method is most useful when broom is the dominant plant present.

**FLAMING**, if done at the seedling stage and weather conditions permit its use at that time. Note: Flaming is the use of a propane torch to apply just enough heat to kill plants by blanching. Plants are not burned with this method. See my article on flaming [here](#)

**HERBICIDES** A 2% solution glyphosate (RoundUp™, etc) in water applied as a foliar spray is effective if done at the seedling stage. However, if done when plants are larger, dead stalks must be removed to facilitate follow-up removal efforts.

**TARPING** may be the most cost effective measure on open sunny sites with prolific seedling production and minimum obstructions. 20 to 30 mil plastic which is used to cover landfills is sometimes available used at no charge at county dumps, and will last for many years if material is spread on top to prevent UV degradation. Tarp edges must be securely dug in all around to prevent light penetration and wind movement. Be aware that tarping will eventually kill all other seeds present, as well as broom.

**CUTTING** not only avoids the need to pull larger plants which require more time and effort, it also arrests disturbance which favors invasive species. Broom larger than 2” diameter usually will not recover if simply cut off very close to the ground. Smaller broom may also be cut, IF the cut stump is treated with a 50% solution of glyphosate or triclopyr, applied in a thin line to completely encircle the stump just inside the bark layer. This must be done within a few minutes. It only takes a few drops. NEVER cut smaller plants without treating the stumps, as they will produce many side branches and stronger roots, making future removal difficult.

**Drought stress cutting** Cutting broom at the time of maximum drought stress may be effective in areas where humidity and light levels are both low in summer. This method is

employed after seed becomes mature, so its use is limited to sites where seed is not present, or after seed pods have been manually removed. Plants are cut in late July or August. The cutting can be done by any method, but the cut must be very close to the ground. Any stump protruding can result in a live plant. Younger broom is more likely to survive cutting. Herbicides are not used with this method. I am still experimenting with this technique, and will update with more definitive information when available.

#### **STEP 4. WINNING: THE FINAL STAGE.**

The amount of time needed to maintain sites usually begins to drop significantly after 3 to 5 years. As the site becomes increasingly dominated by other vegetation, hand pulling becomes the only practical control method. Finding fewer broom gets much more difficult as other growing vegetation begins to obscure it, and it is easy to miss even plants large enough to produce seed. Therefore, it is essential to visit these sites during the flowering period, usually March to April.

Eventually you will reach a stage where you do not see any broom on the site for one or more years. Do not be fooled! Broom may reappear even after several years of absence, so even sites at this stage must still be monitored at least every two years. It is not known yet how many years are needed to conclude a site is completely exhausted. I do know the 24 years experience I have is not enough to provide that answer.

#### **STATISTICS AND THOUGHTS FROM THE FIELD:**

As I write this in 2008, I am presently maintaining over 200 broom sites in 10 parks, most of which were started between 1990 and 1993. My largest site required 409 hours for the initial clearing in 1991. This site now only requires between 8 and 20 hours/yr. Many of my sites now produce fewer than 20 plants per year, and a significant number have not produced broom for several years now.

I am observing increasingly heavy grazing pressure on many broom sites, as our native animals adjust to the presence of broom here and are learning to make use of it.

- Browsing by deer is increasingly keeping plants to a very small size around the perimeter of many broom colonies, preventing seed production and significantly arresting colony spread. Once these infestations are pulled, this effect increases as tender new seedlings are exposed, and access is no longer limited to the perimeter.
- Small herbivores (wood rats and rabbits) gnaw the tender bark of broom much more than native plants, and in some cases succeed in killing the plant by girdling.
- In one park, many broom plants have been completely severed underground by gophers, killing nearly all broom in these stands. (Unfortunately, yellow bush lupine, which is in the same family as broom, was similarly killed, while nearby stands of Coyote bush were not attacked.)
- In some stands of old broom which have never been worked, up to 90% of the broom has died from as yet unknown causes, with very little regeneration observed.