

Controlling *Cortaderia Sp.* with a volunteer hand removal program.

Hand removal of *Cortaderia* can be an effective control strategy if done using the right techniques and proper tools. One person using a correctly sharpened Pulaski with the proper technique can remove a plant of about 12" basal diameter in about 5 to 8 minutes, in average (non-rocky) soil and site conditions. In the period from October 1992 thru March 1993 we have removed many thousands of *Cortaderia* of all sizes and in all types of habitat and slope conditions on state park lands here in the Santa Cruz mountains using volunteers working for the most part only on our regularly scheduled Saturday projects.

Removing large plants: If over about 24" basal diameter, hand removal time goes up by roughly the square of the basal diameter. Plants of this size are most effectively removed by first cutting off the top of the plant with a chainsaw as close as possible to the ground. This gets the above ground, dense and sharp edged leaf mass out of the way, which greatly facilitates safe and efficient access to the root crown. The crown is then chopped out using both edges of the Pulaski alternately, cutting the root crown into small squares, about 3" in size. Each piece is then easily removed with the "adze" edge. The entire root crown must be removed, but you need not take the time to get out each small "rootlet" at the extremities. These will not produce a new plant.

-On steep hillsides, undercutting the root crown from above with a sharpened "sharpshooter" shovel while another person pulls the top of the plant downhill can be very effective.

-Once a root crown is removed, it should be shaken to remove soil, turned upside down, and placed back in the hole just dug on top of leaves and any other nearby mulch. This ensures the kill of the root crown, and at the same time prevents sunlight from reaching the newly disturbed soil, where it can be assumed *Cortaderia* seeds are already present, waiting for just the conditions you have now created to germinate: disturbed soil, sunlight, and no competing nearby plants.

In areas too large to remove in one season: Cutting large plants to the ground will soon show what part of the plant is still living, and in very large plants it will probably be much less than it would appear. *Cortaderia* typically lives 10 to 15 years. The resulting large amount of decaying biomass acts as a germinating medium for seeds falling within, and these plants are typically small, with their roots above ground level. Cutting the plant close to the ground will sometimes remove these "second growth" plants completely. If not, you will soon know, as new shoots will emerge. These can then be "surgically" removed with little effort with the Pulaski. This prevents wasting a lot of energy digging up a huge root system which in many cases is mostly dead.

If an area is too large to cut the plants to the ground, you must shift your immediate attention to the prevention of seed production. Starting about July, monitor the area frequently, and as soon as seed plume stalks begin to emerge, cut them off as low as possible. Many times, bending the stalk sharply will cause it to break at a node, and it can then be pulled out without cutting. The area must be rechecked frequently for new seed stalks, about every 3 weeks, as *Cortaderia* will try again and again to produce seed plumes. In our area, this can occur into October.

If access and scale permit, bag and safely dispose of all seed plumes. If not, jam the seed plume shaft firmly and deeply into the dense biomass at the base of the plant, using the stalk like a spear.

Some notes on working with volunteers. Volunteers can be recruited in sufficient numbers if all channels for "getting the word out" are utilized. Many people are eager to help save our environment; the problem is mostly in reaching them. Newspapers, radio and TV stations have public service programs which will permit you to list your events, usually at no charge. Volunteer exchanges are also good free sources. High schools, colleges, and corporations, and philanthropic organizations are all good sources for whole groups of volunteers.

In addition to accomplishing your restoration goal, working with volunteers will simultaneously increase public awareness not just of the problems of invasive exotics, but of other ecological issues and the personal satisfaction that comes with hands-on help to save our planet. We have an open discussion at lunch which has proven to be an effective means of increasing awareness and knowledge of environmental issues. In the long run, I believe increased awareness will best help us to accomplish our goal of controlling exotics as well as helping people to better understand our planet and our own role in ensuring its continued vitality.