

CalEPPC NEWS

NEWSLETTER OF THE CALIFORNIA EXOTIC PEST PLANT COUNCIL

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Blooming Artichoke thistle (*cynara cardunculus*) in a 14-acre infestation in Los Peñasquitos Canyon Preserve, San Diego, California. Thistle is now under control in the preserve (although not elsewhere in San Diego). **See story p. 4.**



CALIFORNIA
EXOTIC
PEST PLANT
COUNCIL

Who We Are

CalEPPC News is published quarterly by the California Exotic Pest Plant Council, a non-profit organization. The objects of the organization are to:

- provide a focus for issues and concerns regarding exotic pest plants in California;
- facilitate communication and the exchange of information regarding all aspects of exotic pest plant control and management;
- provide a forum where all interested parties may participate in meetings and share in the benefits from the information generated by this council;
- promote public understanding regarding exotic pest plants and their control;
- serve as an advisory council regarding funding, research, management and control of exotic pest plants;
- facilitate action campaigns to monitor and control exotic pest plants in California;
- review incipient and potential pest plant management problems and activities and provide relevant information to interested parties.

Newsletter Submissions

Letters to the Editor, notices, articles, volunteer workday schedules, photographs and line drawings are welcome and may be submitted directly to the editor at the address below. We invite you to utilize CalEPPC NEWS as a forum for describing your project, asking for help, or bringing new issues or developments to the forefront. Electronic submission is gratefully accepted in PC-formatted 3.5" or 5.25" disks for WordPerfect, Microsoft Word, or plain text files. Please enclosed a letter quality hard copy with your disk. Copy for the Spring 1994 issue is due with the editor by June 1, 1994.

Bio-control Funding Workshop Planned

CalEPPC is planning to hold a one-day workshop in Sacramento this spring to develop a coordinated state-wide strategy to enhance biocontrol research for French and Scotch broom, German ivy and perhaps hoary cress. The successful multi-agency strategy that Florida EPPC used to attain full multiple-year funding for biocontrol of *Melaleuca* may be a good model for California. We are seeking representatives from state and federal agencies, county and municipalities, regional land management agencies, private land managers, non-profit groups, researchers, and anyone else with an interest in biocontrol. If you are interested in participating, please contact George Molnar at 415.883.6425. The workshop will only be held if responses indicate a sufficient level of interest.

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President's Message

New EPPCs Forming

John Randall, president

It was *deja vu* all over again for me this March, to paraphrase Yogi Berra. Early in the month I attended the Tennessee Exotic Pest Plant Symposium in Nashville and witnessed the formation of another EPPC. The day-and-a-half long Symposium brought together an enthusiastic audience and excellent speakers. Topics of the presentations ranged from the historic background of species introductions to methods of control for woody forest understory invaders to costs of pest plant control in Illinois to an overview of the non-native pests invading eastern deciduous forests.

The Symposium organizers invited me to give a presentation on CalEPPC, why and how we formed, what we have accomplished and where we might do things a bit differently if we had it to do again. Two years ago Bob Doren and Don Schmitz did the same thing for us when we had our first Symposium in Morro Bay and it was great to pass on the favor. Like our Morro Bay Symposium this one in Nashville resulted in the formal organization of a new Exotic Pest Plant Council. These folks even put together an interim Board of Directors at the Symposium and have tentatively named themselves TENNEPPC. The name may change to indicate a focus on a wider region however, since the Board includes members from Kentucky and north Alabama too. I expect that we will be hearing a good deal from this dedicated, innovative group.

Three of the people who made presentations at the Tennessee Symposium were from Illinois: Randy Nyboer, Bill Glass and Bill McClain. As they drove home together following the meeting and a night out learning that Nashville hosts fantastic Blues musicians too, they discussed forming an EPPC in their part of the country. They have promoted the idea with several others since then so perhaps within a year we will be able to report the formation of a fifth EPPC.

A week after the Tennessee Symposium it was back to the future when I travelled to Orlando, Florida to attend the annual meeting of EPPC - the original group organized 10 years ago. The nearly 150 people who attended the two-day meeting also heard from an excellent group of speakers. Representatives from the other two "new" EPPCs (Tennessee and the Pacific Northwest) also attended and the three of us gave brief reports on our recent activities and accomplishments. Later that evening we met with some of the Florida group's Board members to discuss how we might cooperate on issues of common concern.

One possible scenario will illustrate why it would be wise to coordinate certain activities: CalEPPC and the Florida Council have both expressed interest in promoting biocontrol

and advocating better funding for biocontrol labs in their respective states. If the two groups pursue the issue independently it is less likely that either will succeed and they could end up wrestling each other for any small funding increases allocated to biocontrol. Therefore we proposed the formation of an association or coalition of EPPCs that will encourage coordinated action. Under this proposal, representatives from each of the four independent Councils would meet at least once per year to develop coordinated strategies to address a limited number of common issues. We agreed that each Board should be given the chance to decide whether they want to join such an association and if so which issues they feel it should address.

Although we all agreed that this new association should focus on a limited number of issues, ideally two at any given time, we quickly came up with six worthy of consideration:

1. work with the Weed Science Society of America and the Natural Resources Defense Council to promote improvements in the Federal Noxious Weed Act;
2. promote biocontrol programs for weeds of natural areas;
3. promote good weed control by the U.S. Forest Service and the Bureau of Land Management;
4. promote improvements in USDA APHIS policies in order to help exclude potential pests from the U.S.;
5. promote allocation of funding to cover the exotic pest control needs identified by the National Park Service and;
6. compile listings of flower and garden catalogues that advertise non-native pest plants for sale.

Representatives of the four Councils will meet again this coming October at the Natural Areas Association Meeting in West Palm Beach, Florida. We proposed that only one representative from each would get a vote but others (including YOU) are encouraged to attend and participate.

Proposed Salt Cedar Workshop

A workshop on salt cedar is in the planning stages for late spring/early summer. It will likely be co-sponsored by CalEPPC and the Inyo County Water Department. Anyone who is interested in serving on a workshop committee or in giving a talk should contact George Molnar at 801 Spring Dr., Mill Valley, CA 94941, (H) 415.383.7827.

Portrait of an Invader:

The Ecology and Management of the Wild Artichoke *Cynara Cardunculus*

Alan Pepper, Ph.D. and Mike Kelly
Friends of Los Peñasquitos Canyon Preserve

The wild artichoke (also known as artichoke thistle and cardoon) *Cynara cardunculus* L. is a perennial in the thistle tribe (cynareae) of the sunflower family (Asteraceae). It shares a recent common ancestor with the modern cultivated "globe" artichoke *Cynara scolymus* L. Both plants have their origin in edible *Cynara* cultivars used by early farmers in the Mediterranean region (1). These cultivars were probably subjected to the unintentional selective pressures of the repetitive disturbance environment that is characteristic of agricultural activities such as cultivation and grazing.

This early Mediterranean and Middle Eastern agricultural disturbance regime is postulated to have given rise to many of the worst agricultural weeds and invasive plant species (2), including several thistles (3). In combination with the naturally robust growth properties of thistles world-wide, this evolutionary selection gave the *Cynara* cultivars the genetic potential to become highly successful weeds. *C. scolymus* was developed from the early *Cynara* cultivars in medieval monastery gardens, by artificial selection for superior agronomic properties (1). Many of the aggressive and invasive traits of *C. scolymus* may have been lost during this selection process, as the globe artichoke has not been reported as a problem invasive anywhere in the world (1).

The wild artichoke came to the U.S. in the mid-1800s as the cultivated edible cardoon, *Cynara cardunculus*. Escape from cultivation and subsequent propagation by seed probably resulted in a reversion to many of this cultivar's aggressive and 'wild' characteristics. The result of this evolutionary history is a robust, invasive plant that shares many vegetative and reproductive characteristics with the world's worst weeds (4, see box: 'Weedy Characteristics of *Cynara cardunculus*').

Characteristics of *C. cardunculus*

C. cardunculus has large, deeply lobed leaves and can be 5-6 feet in height and the plant as a whole 5 feet in diameter. The solitary composite flowering heads have spiny phyllaries and showy purple disk flowers. Like the globe artichoke, the bases of the phyllaries and the fleshy receptacle of *Cynara cardunculus* are edible. Others have reported that the petioles and roots are also edible if properly prepared (3,5). *Cynara* has a large perennial tap root, from which the plant regenerates each year. The artichoke grows well in several regions of California, and has been a problem invasive in San Diego, Orange, and Los Angeles Counties, the San Francisco Bay area, portions of the Central Valley, and elsewhere.

C. cardunculus has long been recognized as a horrific pest plant on poorly managed and overgrazed range lands. The artichoke thistle can also become a serious invasive in relatively undisturbed natural habitats such as coastal sage scrub, chaparral, and riparian woodlands.

The 3,500 acre Los Peñasquitos Canyon Preserve, located in a rapidly urbanizing area of San Diego, California, encompasses 14 distinct plant communities and over a dozen sensitive and endangered plant species (6). Prior to control efforts, there were populations of artichoke scattered throughout the preserve, ranging in size from a few volunteer individuals to solid stands several acres

in size. In one 14 acre site, an abandoned sewage pond, artichoke constituted about 50% of the vegetative cover, in a mix with early successional chaparral species.

In several other sites the plant formed monocultures several acres in size. In these colonies, artichoke constituted 100% of the vegetation cover, to the complete exclusion of *all other plant species*. Plants in similar populations have been known to reach densities of 20,000 plants per acre (1). We estimate that prior to the instigation of control measures in 1991, there were greater than 200,000 plants in the preserve.

The large infestations were centers for seed production, facilitating the dissemination of outliers. Once such a massive seed production was established, even undisturbed native habitats were vulnerable. The most invulnerable habitats were disturbed locations, European annual grasslands, and open forb covered (*Hemizonia fasciculata*, *Haplopappus* spp., *Isomeris* spp.) canyon bottomlands. However, we observed healthy volunteers growing in riparian woodlands, under willow (*Salix* spp.), mulefat (*Baccharis glutinosa*) and sycamore (*Platanus racemosa*), as well as sizable populations in southern mixed chaparral, chamise chaparral and in high quality coastal sage scrub.

We documented the invasion of artichoke into populations of San Diego thorn mint, *Acanthomena ilicifolia* (California listed Endangered Species). The invasion of artichoke was highly disruptive to the fragile canyon ecosystem. The artichoke is not subject to significant herbivory by deer; although the younger seedlings are sometimes eaten by rabbits. The absence of observable wildlife trails or spoor among the artichoke indicated that the large infestations of artichoke were a significant obstacle to wildlife movement. The artichoke was not heavily used for nesting or predatory activities of birds; however the seeds did provide a seasonal food source. The major ecological effects of the artichoke were displacement of native vegetation in a significant portion of the preserve, resulting in the fragmentation of higher quality habitat, and the continuing invasion of habitats occupied by sensitive plant species and communities.

Strategies for the control of *C. cardunculus*

C. cardunculus is quite large, and more importantly, it has a perennial tap-root, capable of vigorously regenerating unless the entire root system is destroyed. It is for this reason that previous attempts to control the artichoke by plowing, chaining, scraping and bulldozing have been unsuccessful. Removing the deep tap root system from the often hard clay soils of Peñasquitos canyon was a nearly impossible task for an individual plant, let alone for tens of thousands. Bio-control is not an option due to the close phylogenetic relationship to the cultivated artichoke, *C. scolymus*. We therefore adapted an artichoke control strategy for Peñasquitos canyon based mainly on the application of herbicide. We chose glyphosate (Monsanto's Round-Up®, Ortho's Kleen-Up®) because of its well known effectiveness in the control of perennial dicots (7) and for its favorable safety and environmental characteristics (e.g. 7,8,9).

Control of *C. cardunculus* in Los Peñasquitos Canyon Preserve

We utilized a two part control method as follows:

1. Decapitation of flowers and seed heads prior to maturity. This action was undertaken to reduce total seed production and was accomplished by volunteers equipped with machetes. This method was most valuable in slowing the spread of the plant in areas where herbicide spraying was not possible at the time.

2. Foliar application of 2% glyphosate (Round-Up®) during the active growth period (January-July). This has been accomplished by trained volunteers, under the general supervision of the San Diego City Parks Department.

Backpack sprayers were well suited for spraying in remote canyons and on hillsides. For larger populations on the canyon bottom, the Friends of Los Peñasquitos Canyon Preserve purchased a 25-gallon poly-herbicide tank with a 10 horsepower pumping motor and 100 ft. of hosing (about \$400 total investment). This equipment, mounted on a 4-WD pickup truck, was invaluable in treating



Artichoke thistle bloom. Purple flowers are attractive to the public, prompting "Why are you killing it?" questions. Note the spines — which make it difficult to work around.

large colonies where it was possible to drive into the area. A 14-acre patch could be sprayed in a single, long day with a truck mounted sprayer, a three person crew and additional herbicide and water for refilling the sprayer tank. While one person sprays, the second and third crew members move the hose and truck as needed. Our chief volunteer artichoke sprayer found a pair of chain-saw chaps to be invaluable for moving through the dense spiny patches.

Three year results

Volunteers from the Friends of Los Peñasquitos Canyon Preserve began their artichoke control efforts in 1991 and are now about to begin a fourth season. In our first and second seasons, we were limited by not having identified all of the populations of the plant, not having a truck-mounted sprayer and having only a limited number of volunteer hours.

Our third year was most successful. Due to the efficiency of the truck-mounted sprayer in treating large colonies, and the efforts of dedicated volunteers with backpack sprayers in locating and treating outliers, we believe we sprayed nearly every known plant in the preserve. Many of the established colonies and individuals were treated three to four times between January and August. Since 1993 was a very wet year, new artichokes were germinating as late as July; These were also sprayed with 2% Roundup®. By May 1994 it has become evident from the number of artichoke seedlings that the seed bank is far from depleted — despite little seed dispersal for two years.

Optimizing herbicide applications

The herbicide spray should cover the plant's leaf surface thoroughly to ensure there is enough herbicide in relationship to the underground root mass. Young seedlings can usually be killed with one application of 2% Roundup®. In larger plants, spraying is most effective when the flower stalk is bolting, the time of maximum growth. Spraying prior to this time gave less than satisfactory results. In mid-aged plants (2-3 feet tall) in their second season of growth we achieved 50% killing with one application of glyphosate. When larger clumps of plants, in their third or more season of growth, were sprayed at the same stage, only 20-25% killing was achieved. In contrast, at the bolting of the flowering stalk, a 93-98% effective kill was achieved with one application of 2% Roundup®. Even later in the season, we still had success in killing plants sprayed after the seed heads were mature and drying out.

As volunteers, we did not have the luxury of being able to schedule large crews during the optimal periods for spraying. We instead had to make use of volunteer work hours that spread out over several months. Early in the season we concentrated on remote areas reachable only on foot with backpack sprayers. These outlier populations are usually younger in terms of years of growth, and therefore more susceptible to an earlier application of glyphosate (since artichoke seedlings germinate over a period of months, rather than in a short burst, we revisited these sites two to three times more during the season to spray new seedlings and resprouts). We left the large populations, almost all reachable by the truck-mounted sprayer, for treatment during the optimal period.

To increase absorption of the herbicide, we added a non-ionic surfactant (Monterey Herbicide Helper). A blue dye was added (Ben Meadows Company) to keep track of our spraying efforts. We found that it pays to cut down the old stalks from the previous year's growth, particularly in large populations. Otherwise, walking in the patch is quite difficult, and much of the herbicide is wasted. We favor a powerful brush saw (Husqvarna 41) with a metal cutting blade. Although these are sold as weed whips with nylon strings or blades, the larger models come with a conversion kit that allows them to use a metal blade. With large monocultures of artichoke, or artichoke mixed with other non-native weeds, we found that mowing is sometimes useful. Mowing before the active growth season will remove old growth and make later spraying easier and more effective. Mowing of actively growing artichoke will not kill the plant, but will "buy some time" if management considerations or the weather delay spraying. In addition, after mowing, the plants will resprout less vigorously.

Cut stump, herbicide application — an experiment

Jo Kitz of the Santa Monica chapter of the California Native Plant Society reports successfully killing *C. cardunculus* using a cut stump method. After cutting the plant off close to the base, a 25% solution of Roundup® was applied to the stump. Resprouts were similarly treated. In Peñasquitos Canyon Preserve volunteers

began using this method in January 1994. We intend to use it on remote populations at different stages of growth to test its efficacy.

This method holds several possible advantages over foliar spray application in several situations. Carrying a 3-gallon backpack sprayer a mile or more up and down hills in brushy terrain to treat remote infestations is a strain for even the most dedicated volunteer. For cut stump treatment, however, a cutting tool (machete, loppers, short garden hoe) and a small hand-held herbicide sprayer and a pair of gloves are much lighter to carry. This approach — if effective — will also be better when working in areas where collateral damage is possible, especially with sensitive species nearby. To minimize possible damage when using a cut stump herbicide application for smaller plant stumps of any invasive species, the Friends use a brushing technique. Instead of a sprayer, volunteers use a plastic rubber cement jar with a brush built into the lid. Herbicide is brushed directly onto the cut stump with no chance of collateral damage.

Conclusions and future work

Cynara cardunculus is a robust, aggressive thistle capable of forming dense, massive monospecific stands in disturbed habitats, and capable of invading natural and semi-natural plant communities. Perhaps due to a limited range of dispersal, seed number seems to be an important factor in invasions by artichoke. Therefore control measures must focus both on limiting the spread of out-liers and on reducing major seed sources. For this reason, managers of parks and natural preserves should be observant of invasive plant conditions on adjacent lands that have other uses, such as grazing.

In Los Peñasquitos Canyon, we have made major advances toward the complete eradication of one of the worst invasive plants in the preserve. This was achieved with the tireless labor of a relatively small number of volunteers. Future control measures will focus on the treatment of resprouts and newly germinated seedlings. We plan to continue this effort indefinitely. We will also continue to survey the preserve for new plant locations, and have recruited members of a ranger-supervised volunteer bicycle/equestrian/foot patrol in this effort. The Friends of Los Peñasquitos Preserve also has an ongoing commitment to educating recreational users of the canyon and the general public about invasive exotics, through docent-led hikes and nature walks, and through articles in local newspapers. In the higher quality habitats, removal of the artichoke will stimulate the growth of endogenous native species. At the sites of the larger infestations, we will undertake active restoration by planting and seeding with species appropriate to the affected habitat.

The authors dedicate this article to the passionate volunteers who donated more than 230 hours of labor in 1993 alone to the artichoke projects in Los Peñasquitos Canyon.

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Weedy Characteristics of *Cynara Cardunculus*

Rapid growth. Under favorable conditions *C. cardunculus* undergoes rapid growth to a large size. This growth (facilitated, in part, by food reserves stored in a perennial root) is a competitive advantage during re-establishment and allows rapid achievement of reproductive maturity.

Continuous seed production. Although there is a discrete reproductive phase of plant growth, with flowering occurring from March through July, there can be flowers at very different stages of maturity on any single plant, at any given time. This results in the production of viable seeds over several months of the year.

Versatile seed productivity. *C. cardunculus* grows well and produces viable seeds in a variety of habitats, from mesic riparian sites to quite xeric rocky slopes.

Dispersal mechanisms. We observed dispersal of fruits by birds and wind. The latter is facilitated by a well developed pappus.

Germination breadth. We observed the establishment of outlier seedlings in a variety of habitats and environmental conditions and at various times of the year. We consider this to be evidence that the artichoke seeds will germinate under a wide range of conditions.

Discontinuous Germination. Germinating artichokes are observed after the first winter rains in November or December, and germination continues, under favorable conditions, through July. We do not know whether the discontinuous germination is due to internal, physiological mechanisms, or environmental factors such as soil disturbance.

Vegetative reproduction. Resprouts vigorously from perennial root.

Rosette growth. Large leaves near the ground crowd out and shade competitors. Leaves also constitute a physical barrier that limits herbivory.

Brittle — hard to uproot. Stem often breaks at ground line. The root is deep and extensive.

Allelopathic mechanisms. Where *C. cardunculus* grows with other plant species, such as annual grasses, there is often a distinct zone of bare ground beyond the artichoke, suggesting some mechanism of inhibition. In addition, after the fall die back, the large dead leaves drop to the ground where they undergo virtually no decomposition, thus providing another barrier to competitor species.

Herbivore defenses. The wild artichoke is heavily armored, with spines on the leaves, stems and the phyllaries. Chemical mechanisms may be involved in these defenses as well, as several of the volunteers working on our projects had painful wounds requiring medical attention long after the spine was removed.

Other 'weedy' characteristics. Although we have not performed any rigorous studies on self-fertility, observations of small outlier populations have led us to suspect that *C. cardunculus* is at least facultatively self-compatible. Phenotypic plasticity has been observed in shaded environments, such as the riparian understory, where plants have narrower, longer leaves. The possibility of local genetic variants has been suggested anecdotally, as has the possibility of hybridization with cultivated artichoke, *C. scolymus*.

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A French Broom Control Method

Greg Archbald

Nearly twenty years ago I met French broom. It was crowding around the house where I lived in Mill Valley, California, and I was worried about the fire hazard. Ecological concerns came later. But I started trying to control it, at first getting down on my hands and knees, chopping out the plants with a machete and even a Chinese cleaver on a few occasions. (I still have all my fingers.)

Over the years there has been some progress on this subject, but I sometimes wonder about the old adage "Too soon we get old, and too late smart." On the bright side, we now have CalEPPC and the Weed Wrench tool. Some scientists, like CalEPPC's Carla Bossard, have done rigorous studies. And more land managers and homeowners than ever before are out there gaining experience, experimenting and sharing what they learn. There is hope.

I would like to share here a mechanical control method that has become my favorite. The method comes out of my experience with the Habitat Restoration Team in the Golden Gate National Recreation Area and, most specifically, from volunteer work I have done on a Marin County Open Space District preserve called Alto Bowl behind my present home. I have used the method to clear large patches of broom in my spare time after work and on weekends, usually on my own but sometimes organizing neighbors to help out.

This method is most applicable to disturbed, open grasslands (with mostly exotic annual grasses) where French broom can be at its most aggressive. In my work at Alto Bowl, the main site has been a south-facing slope several acres in size with scattered groves of coast live oak and some coyote brush. Soil is heavy clay to somewhat loamy, with little rocky material. Annual rainfall is usually over 20" and there are few hard, dry places. The French broom itself ranges from stands of young plants with small diameter stems to horrible tangles of old or dead broom. Changes in these factors at your own site, of course, would have a bearing on how well this method will work for you.

In a Nutshell — the key steps:

- Cut broom at or below ground level, in late July or August after broom has gone to seed and soil moisture is at a seasonal low.
- Arrange cut broom with stems all parallel, in bundles that can be carried.
- Make large compact brush piles with bundles of cut broom. Locate brush piles on the site in locations that minimize visual impact and fire hazard.
- Next summer, after grasses are dry and have dispersed their seed, destroy new French broom seedlings. Repeat in following seasons until seed bank is exhausted.

Comments

The point of cutting in late July or August is to deprive broom plants of their ability to synthesize nutrients at a time

when stored energy reserves in the root system are at their lowest. I use a heavy-duty brush cutter with an 80-tooth blade, getting the blade right down on the soil, or even slightly into the soil. This is hell on blades but worth the price in high mortality of broom. (I keep about a dozen blades on hand, rotating about half of them through my local saw sharpening shop during the cutting season.)

Experienced broom bashers will cringe, as I first did, at the thought of letting the broom go to seed before dealing with it. My advice is to force yourself. You want those plants to deplete their energy reserves before you cut them. The extra seed you are allowing into the seed bank will be depleted just one year later than if you had not allowed that first year's seed to fall. If you absolutely cannot allow first year seed to fall, I recommend that you cut the broom about 6" above ground in winter or spring, then pull the stumps with a Weed Wrench tool before they re-sprout with heavy new growth.

The point of bundling and stacking the broom into brush piles is to clear the way for exhausting the seed bank. Getting the broom out of the way makes it easy to control the massive flush of broom seedlings that often emerges after mature broom is removed.

By summer after first removal of mature broom, many seedlings will be up to 6" tall with very slender stems. They are quite vulnerable at this stage. I have caused near 100% mortality of seedlings by hitting them with my brush cutter blade in summer following mature broom removal. To make sure the plants will die, I put the blade right onto the ground and wiggle the blade back and forth to slash through the seedling stems at or below the root crown level. To eliminate the seed bank completely, annual follow-up is absolutely essential.

In addition to clearing the site for easy seed bank reduction, bundling and stacking the broom also solves the broom disposal problem in a simple, cost-effective way with minimal impact on the site. Pulled broom decomposes fairly rapidly when stacked in this manner, the pile growing smaller each year.

One possible drawback of bundling and stacking is exposure of the site to erosion, particularly in cases where a long-standing broom monoculture has eliminated most grasses and forbs. Leaving cut broom scattered on site as mulch may reduce erosion, but it will also make it very difficult to reduce the seed bank in subsequent seasons. You lose the advantage of easy seedling control using a brush cutter and are forced into some other method of dealing with continued generation of new broom from the seed bank.

If you want to retain the advantages of the French broom control method suggested here, select an erosion control technique that (1) leaves the seed bank free to proliferate, and (2) either leaves the surface free of obstacles in discrete sections or can be easily cleared for brush cutter work on seedlings.

Arundo Donax Workshop

Nelroy Jackson

The Arundo donax Workshop, co-sponsored by Team Arundo and CalEPPC, was held on Friday, November 19, 1993, at the Ontario Airport Hilton Hotel in Ontario, Ca., was a tremendous success. Over 100 attendees represented an incredible variety of agencies, organizations, consultants, and private citizens from San Francisco to San Diego. This was, apparently, the "First-of-a-Kind" Workshop/Symposium on a single exotic pest plant in California.

The varied program went off without a glitch, and the presentations were received very well. About 25 persons toured the Pilot Project before the Workshop. The Riverside Press Enterprise published a complimentary Front Page story on the workshop. We had an impressive 53% response on evaluation forms — unanimously positive and constructive.

Sally Davis staffed a CalEPPC table, sold many back copies of the newsletter and signed up new members. A "Proceedings" of the Workshop is now off the press. All attendees received complimentary copies. Additional copies are available for sale. Write me at 400 S. Ramona Ave., #212, Corona, CA 91719 for information.

(French broom cont'd)

One erosion control technique meeting both of these conditions, for example, has been used successfully in the Golden Gate National Recreation Area. Pulled (or cut) French broom of medium size is tied into small bundles and staked along contour lines at intervals as brush bars. Erosion is reduced and clear areas between brush bar lines afford the opportunity of easy follow-up.

Finally, you will of course want to take special care if you have native plants on site that need protection. I go slowly with my brush cutter, stopping when I see a young coyote brush plant or an oak seedling. It's pretty easy to notice them in late summer since nearly everything else except the broom seedlings and a few other perennial species has dried out and gone to seed. I leave small islands of uncut broom around the plants I want to save. Then I come back in winter when the ground is soft and pull the broom by hand or with a Weed Wrench tool.

Conclusion

The mechanical control method described here is the best I have found to date. It offers an efficient way to remove and dispose of a mature French broom population, and a very easy way to exhaust the seed bank in successive seasons. I hope you will experiment with it, argue with it or even ignore it if you have a better method. But whatever you do, share your thoughts and methods with the rest of us through the CalEPPC newsletter. Keep progress (and hope) alive.

[Editor's note: write New Tribe, 5517 Riverbanks Road, Grants Pass, OR 97527, 503.476.9492 for a brochure on the Weed Wrench Tool.]

Artichoke Thistle Summit

by Nelroy Jackson & Mike Kelly

An Artichoke Thistle Summit, sponsored by The Nature Conservancy and the County of Orange Environmental Management Agency (OCEMA) was held in Dana Point, California December 9, 1993. The purpose of the gathering was to discuss methods of controlling *Cynara cardunculus*, artichoke thistle (see article this issue). Artichoke thistle is a serious natural areas and agricultural pest problem in Orange County, infesting thousands of acres.

Some 23 representatives of difference agencies, parks, private ranches and land conservancies attended, including 3 CalEPPC Board Members and 3 Team Arundo Members. In addition to the host organizations, those represented included Crystal Cove and San Clemente State Park, Rancho Mission Viejo, The Irvine Co., the Santa Margarita Co., the California Dept. of Food & Agriculture, the National Audubon Society's Star Sanctuary, the Monsanto Co. and a number of different departments of the County of Orange.

Martha Blane, a habitat restoration consultant laid the basis for the discussion with a talk on the ecology of artichoke thistle. Bill Tidwell from the Organe County County of Orange Environmental Management Agency /Public Works Dept. presented a slide show history of successful artichoke thistle control efforts in the late 1980s in Orange County. Tidwell's presentation was inspiring because he showed that large infestations, when properly treated, can be eradicated. His agency eradicated about 1,400 acres of artichoke thistle over a three-year period. He emphasized the importance of followup to prevent reinfestation. His presentation was thorough in its discussion of techniques and equipment that worked for them in their successful effort.

Other case studies were presented by Dave Pryor, Crystal Cove State Park; Wayne Forsythe, Rancho Mission Viejo; and Mike Kelly, Los Peñasquitos Canyon Preserve, San Diego.

Mike Pitcairn, California Dept. of Food and Agriculture discussed the infeasibility of biological control efforts since *Cynara cardunculus* is closely related to *Cynara globulus*, the commercially grown artichoke that graces many a dinner table and the two may interbreed.

Areas ravaged by the Laguna Beach fire present an opportunity for controlling artichoke thistle. Dave Pryor has new funds to combat cardoon. The major landowners — the Irvine Company and Rancho Mission Viejo — are cooperating. Suggested names for the group (takeoff of Team Arundo) are "Sayonara Cynara" and "Cardoon Core."

As with the Team Arundo approach, this type of summit focusing on a target exotic invasive should prove to be a useful approach for other geographic areas to emulate.

German Ivy Engulfing Riparian Forests and Heading for the Uplands

Woody Elliott, Associate Resource Ecologist, San Simeon District
California Department of Parks & Recreation

[**Editor's note:** since receipt of this article the CalEPPC board has been informed of what appears to be an early infestation of German ivy in San Diego, California.]

German ivy (*Senecio mikanioides*) blankets the riparian forests of San Simeon and Santa Rosa Creeks of San Simeon State Park. It climbs up 15 to 20 feet through the overstory of willows and cottonwoods and covers the understory like a solid mat similar to the habit of native blackberry. It is an invasive weed that dramatically reduces biodiversity and has already displaced substantial patches of riparian forest in the park.

German ivy is not German nor an ivy. It is native to the wilds of South Africa and belongs to the sunflower family. Its shiny green leaves, clusters of yellow disk flowers and resiliency make an attractive ground cover or trailer in planter boxes from which it probably escaped. In riparian habitat its presence is most noticable in winter when the leaves have fal-



len from the overstory of willows and cottonwoods and its clusters of bright yellow flowers are offset on a solid green background of its perennial leaves. This year I have not been able to observe production of any seed. Only female disk flowers were seen with no pollen present for fertilization. Dispersal of stems that readily root from its nodes may be its primary mode of reproduction.

In San Simeon Park north of San Luis Obispo on the Central Coast, German ivy is beginning to push out from the riparian forest into the uplands of coastal scrub, grassland and Monterey pine forest as well as being present in patches on the coastal bluffs and in a seasonal wetland.

Last fall I tried the systemic herbicides Roundup® and Re-deem®, a formulation of Garlon®, with a surfactant in an at-

tempt to contain German ivy in the patches outside of the riparian areas. The treatments killed the exposed leaves that were coated with herbicide. However, leaves resprouted from stems beneath the canopy and the duff. Retreatment will be necessary. Perhaps prescribed burning prior to respraying might improve the effectiveness of a herbicide. Fire would remove the dead material and the duff that covers the resprouting stems which would increase contact of the herbicide with live foliage.

In San Simeon Park German ivy is expanding from several patches within an isolated stand of riparian forest along a reach of San Simeon Creek. Application of herbicide to contain its expansion is being planned in this area for the winter when the overstory of willows and cottonwoods have lost their leaves making the German ivy visible and the deciduous trees less susceptible to herbicide.

Bob Brenton of Dow-Elanco Corporation is developing protocols for use of herbicides to control German ivy in field trials on at least two state parks in Marin and Sonoma Counties in cooperation with Dave Boyd and Marla Hastings of Calif. Dept. of Parks & Recreation. According to Greg Archbald, Golden Gate National Park Association, field evaluation of these trials will occur in summer, 1994.

The only long term solution to management of German ivy that seems practical is the introduction of organism(s) that feed on it. Tansy ragwort (*Senecio jacobaea*), native to Eurasia and a weed in pastures on the north coast of California, has been adversely impacted by two introduced insects. Perhaps these insects could be collected and released onto German ivy to achieve control according to Charles Turner of the USDA Agricultural Research Service in Albany, California. This year, as a precursor to field trials, he and Michael Pitcairn of California Dept. of Food and Agriculture will test whether these insects can reduce the vitality of German ivy in the laboratory. If these insects are not successful, biological control of German ivy would probably involve the importation of insects from its native range. Before release, these insects would need to be quarantined and tested for effectiveness of control and host specificity to insure that they will not harm native or agricultural plants. This testing could take several years and would not be cheap.

The California Exotic Pest Plant Control Council (CEPPCC) has established a working group to explore methods for control of German ivy. David Chipping, a California Native Plant Society activist and professor of geology at CALPOLY San Luis Obispo, is coordinator for the group. You can get up-to-date on the activities of the group and the latest information on German ivy control by contacting him by phone at 805.528.0362.

Report from the CalEPPC Working Group Yellow Starthistle Experimental Group

Mike Pitcairn

[**Editor's note:** Each of the herbicides mentioned should of course be checked for its restricted or general usage.]

There are six general methods used to control yellow starthistle: mechanical (mowing or discing), fire, chemical (herbicides), biological (insects and diseases, plant competition, grazing), preventive, and integrated control. In the last report (CalEPPC newsletter vol. 1, no. 3, summer, 1993), the mechanical control methods were described. Much of this information was obtained from Craig Thomsen and Marc Vaysieres at the University of California at Davis. Craig and his colleagues have recently produced a Range Science Report No. 33 (January 1994) entitled: "Yellow Starthistle Control" in which they go into more detail on the use of mowing and grazing as well as other methods for controlling yellow starthistle. This report is available at all University of California Cooperative Extension offices.

Now I want to present information on chemical control methods. Tom Lanini, a cooperative extension weed scientist at the University of California at Davis prepared a report on using herbicides to control yellow starthistle. The information presented here is from his report and is reprinted with his permission. There are two types of herbicide treatments that are recommended for yellow starthistle control: post-emergent treatment and pre-emergent treatment. The following information is organized into these two treatment methods. And, remember, before using any chemicals, carefully read and follow precautions on the label.

"Post-emergent herbicide treatments generally work best on seedlings. The long germination period of yellow starthistle makes control with a single application almost impossible. A treatment following the first flush of seedlings opens the site up for later flushes. Waiting until later in the rainy season allows a greater number of seedlings to be treated but may not control larger plants or may require a higher herbicide rate.

"2,4-D can provide acceptable control of yellow starthistle when applied at the proper rate and time. Treating in mid-February, when plants are small, provides better control than later applications. Both amine and ester forms are equally effective at the small rosette stage of growth, with required rates being 0.5 to 0.75 lb/acre. Applications made later in the season, after bolting has been initiated, would require a higher application rate (1.0 lb/acre) to achieve equivalent control. 2,4-D is a broadleaf herbicide and will control other broadleaf plants, but generally will not harm grasses. Drift from 2,4-D applications is common, particularly from the ester formulations. Use caution when applying near sensitive vegetation. 2,4-D is a restricted use pesticide, requiring a permit for use.

"Dicamba is very effective at controlling yellow starthistle at rates as low as 0.25 lb/acre. Applications made as

late as mid-March have provided excellent control, although earlier treatments are slightly better. When yellow starthistle rosettes are small, i.e. 1-2 inches across, the 0.25 lb/acre rate works excellently, but higher rates may be needed if the plants are larger in size. Dicamba is a broadleaf herbicide and will control many other broadleaf plants, but generally will not harm grasses. Drift from dicamba applications is common; use caution when applying near sensitive vegetation. Dicamba is a restricted use pesticide, requiring a permit for use.

"Triclopyr at the rate of 0.5 lb/acre can provide complete control of small emerged yellow starthistle seedlings. Larger plants require rates up to 1.5 lb/acre. Triclopyr is a foliar absorbed, broadleaf herbicide with little or no residual activity. Triclopyr generally will not harm grasses.

"Glyphosate provides moderate control of yellow starthistle at 0.5 lb/acre rates. Good coverage, clean water, and actively growing yellow starthistle plants are all essential for adequate control. Glyphosate is non-selective, controlling most plants.

"Preemergent herbicides must be applied prior to germination and emergence to be effective. The long germination period of yellow starthistle requires that a preemergent material have a long residual. When yellow starthistle plants have already emerged, the combination of a postemergent herbicide to control emerged plants and the preemergent herbicide to provide residual control of any subsequent germination is an effective control strategy. The following materials are not labeled for use in pasture or rangeland, but can be useful for yellow starthistle control along rights-of-ways and non-crop areas.

"Atrazine is a preemergent material that can control yellow starthistle at use rates of 1 to 1.5 lbs/acre. Rates lower than this generally do not provide adequate control. For atrazine to be effective, applications must be made prior to seedling emergence, as this is primarily a root absorbed chemical.

"Simazine is a preemergent herbicide effective against yellow starthistle when used at rates of 1.5 lbs/acre or higher. This material is absorbed tightly to soil so the chances of leaching are less than atrazine. Like atrazine, it is root absorbed. Both atrazine and simazine work by blocking photosynthesis.

"Sulfometuron is a preemergent material registered for roadside use that is very effective on yellow starthistle. Use rates for effective control are 1 ounce/acre. Like atrazine, best control is achieved when applications are made prior to emergence. Applications should be made prior to rainfall, to allow for material to move into the soil. When applied to dry soil, the risk of offsite movement, along with dust, can injure susceptible plants."

CalEPPC Welcomes New Members

Our membership is growing! CalEPPC warmly welcomes the following people and organizations who have joined January - April.

Institutional

Sustaining: Monsanto Company Agricultural Group
Regular: CA Dept. Parks and Recreation, San Simeon District
Tree of Life Nursery
DowElanco

Individual

Lucie J. Adams	Donald A. Bartel	Carl E. Bell
Carole Binswanger	Vanelle Carrithers	Walt Decker
Sharon Dougherty	Billy Lee Holder, Jr.	Douglas A. Justison
Judith Lowry	Robyn S. Menigoz	David Minnesang
Pat Pittman	Stephen B. Place	David R. Pryor
Michel D. Remington	David Schooley	Ted St. John
Gerald Taylor	Peter Warner	Phyllis N. Windle
Frank D. Zarate		

1994 Calendar Year Dues

Membership Categories

	Individual	Institutional
<input type="checkbox"/> Student	\$15	
<input type="checkbox"/> Regular	\$25	\$100
<input type="checkbox"/> Contributing	\$50	\$250
<input type="checkbox"/> Sustaining	\$250	\$1,000
<input type="checkbox"/> Lifetime	\$1,000	

Other Gift \$ _____

Please make check payable to: California Exotic Pest Plant Council or **CalEPPC**. Mail your form and check to:

CalEPPC Membership
c/o Sally Davis, 448 Bello St., Pismo Beach Ca 93449

Join CalEPPC Today!

If you would like to join CalEPPC, please remit your dues using the form provided. All members will receive the CalEPPC Newsletter, be eligible to join CalEPPC working groups, be invited to the annual meeting, and participate in selecting future board members. Your personal involvement and financial support are the key to success. Additional contributions by present members are welcomed!

Name _____

Organization _____

Address _____

City, State, Zip _____

Office Phone _____

Home Phone _____

FAX _____

Call for Nominations

It's that time again. Each year CalEPPC must elect its officers and half its Board of Directors. See page 2 of this issue for a list of our current officers and board members. A nominations committee of Mike Kelly, Sally Davis and George Molnar was formed to help guide the process. Your nominations for any of the officer or board positions are welcome. Please make your nominations in writing by June 1 to any member of the committee. You'll find addresses for all also on page 2. Be sure to include information on the nominee and an address and phone number where he or she can be reached (to accept or reject the nomination).

We will mail out a ballot with all the nominations to all members of CalEPPC — probably as an enclosure with the next issue of the newsletter. Be sure to fill out the ballot and promptly return it.

We will be electing four officers, President, Vice-president, Treasurer, and Secretary; and 3 at-large members of the Board of Directors. The officers will serve a one-year term while the at-large members of the Board will each serve a two-year term.

What does it take to be an officer or at-large member of the Board of Directors? Board members should be able to travel to between 4 and 6 meetings of the Board. These meetings are usually held in either the Bay Area or the Sacramento Area, with an occasional meeting in Southern California. Given the paucity of financial resources of our new organization, CalEPPC is unable to finance the travel of its Board members to meetings. This means members must pay for such travel themselves or seek reimbursement from their agency or company.

Besides attending Board meetings, officers and board members should be willing to commit themselves to heading up or participating actively in a committee or working group.

Weed Alert

Mike Kelly reports that two invasive species have recently been spotted in the San Diego region. These are German ivy (*Senecio mikanioides*) and a broom tentatively identified as *Genista monosperma*. The San Diego Chapter of the California Native Plant Society, CalEPPC and the Friends of Los Peñasquitos Canyon Preserve are mailing a "First Alert" bulletin throughout the area with illustrations and descriptions of both plants to learn if they are isolated infestations or more widespread. They are formulating plans to quickly eradicate both before they become the problems they already are elsewhere in California. The German ivy was found in Sabre Springs, upstream of Los Peñasquitos Canyon Preserve, while the Genista was found on the Fallbrook Naval Weapons Station.

Upcoming Meetings

- **June 7 – 10 1994 Fort Collins, Colorado**
The fifth International Symposium on Society and Resource Management. Contact Michael J. Manfredi, Human Dimensions in Natural Resources Unit, State University, Fort Collins, CO 80523.
- **July 27 – 28 1994, Fort Bragg, California**
The Weed Committee of the California Forest Pest Council will hold a field meeting in July. The meeting will focus on pest plants in forest settings. Contact Fleming Badenfort,
- **August 9 – 14 1994, Lansing, Michigan**
SER 1994 Conference *Saving All the Pieces* will be held at Lansing Community College. For more information contact Robert Welch, 517.483.9675, FAX 517.483.9619.
- **September 30 – October 1 1994 Sacramento Area**
CalEPPC Symposium '94 to be held at the Hyatt Sacramento. For program information, contact Greg Archbald at 415.776.1607. **Posters:** contact Mike Parker at (w) 510.792.0222 or (h) 510.795.6766.
- **October 17 – 22 1994 West Palm Beach, Florida**
1994 Natural Areas Conference to be held at the Palm Beach Gardens Marriott. The 21st annual conference will be hosted by the South Florida Water Management District. For information regarding planning of this meeting contact Bill Helfferich at 407.687.6637. For information contact either Eric Menges 813.465.2571 or Mike Duever, 813.657.2531.

CFPC Weed Committee Field Meeting July 27 & 28, 1994 Fort Bragg — Mendocino Coast Area

The California Forest Pest Council, Weed Committee extends an invitation for interested CalEPPC members to attend our summer field meeting. The Council is an advisory body to the State Board of Forestry. The Weed Committee, one of six standing committees, deals with plant pests in forest settings.

The July field meeting may be of particular interest to CalEPPC folks this year as we will be looking at exotic pest plant issues as well as native plant competition in forested landscapes. Many of the sites to be visited are located on the Jackson Demonstration State Forest (JDSF) where the CalEPPC French Broom Working Group has established experimental plots to test a variety of potential control treatments. Carla Bossard of your French Broom Working Group will likely host this tour stop.

State highway and PG&E power line right-of-ways passing through the state forest also offer examples of both exotic and native vegetation management in a cooperative multi-jurisdictional setting. We hope to have representatives of both Caltrans and PG&E as on site presenters for tour stops.

Vegetation management of industrial timberlands is often in the forefront of the news. You may find of interest the integrated vegetation management approach utilized by several north coast timber companies and the opportunity to talk with their foresters. Tour stops are being planned for lands managed by Georgia-Pacific Corp., Louisiana-Pacific Corp. and possibly a look at Gorse control on California State Park land.

Please express your interest in this meeting to Fleming Badenfort, secretary/treasurer, 707.485.8731 for information.

— *Walt Decker, forester (JDSF)*

CalEPPC News

c/o Friends of Los Peñasquitos Canyon Preserve, Inc.
P.O. Box 26523
San Diego CA 92196

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Spring/Summer2000

INVASIVE PLANTS *of* CALIFORNIA'S WILDLANDS

[illegible]

1000000

Carlo C. Bassford,
John M. Randall, and
Merrill C. Hochstetler

Finally!

See P. 4

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Who We Are

CalEPPC NEWS is published quarterly by the California Exotic Pest Plant Council, a non-profit organization. The objects of the organization are to:

- provide a focus for issues and concerns regarding exotic pest plants in California;
- facilitate communication and the exchange of information regarding all aspects of exotic pest plant control and management;
- provide a forum where all interested parties may participate in meetings and share in the benefits from the information generated by this council;
- promote public understanding regarding exotic pest plants and their control;
- serve as an advisory council regarding funding, research, management and control of exotic pest plants;
- facilitate action campaigns to monitor and control exotic pest plants in California; and
- review incipient and potential pest plant management problems and activities and provide relevant information to interested parties.



Please Note:

The California Exotic Pest Plant Council is a California 501(c)3 non-profit, public benefit corporation organized to provide a focus for issues and concerns regarding exotic pest plants in California, and is recognized under federal and state tax laws as a qualified donee for tax deductible charitable contribution.

2000 CalEPPC Officers & Board Members

Officers

President	Mike Kelly	mkellysd@aol.com
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* Board Member whose terms expire December 31, 2000

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CalEPPC web site: www.caleppc.org

CalEPPC News Editor: Mike Kelly (see above for address)

Submission Dates for CalEPPC News

If you'd like to submit a news item, article, meeting announcement, or job opportunity for publication in the CalEPPC News, it must be received by the deadlines listed below. Editor reserves the right to edit all submissions. Send your text/disk/email to editor's address above.

Submission Dates:

Fall ... October 15 Winter ... January 15 Spring ... April 15

The articles contained herein were contributed to the CalEPPC newsletter. These articles represent the opinions of the authors and do not necessarily reflect the views of CalEPPC. Although herbicide recommendations may have been reviewed in contributed articles, CalEPPC does not guarantee their accuracy with regard to efficiency, safety, or legality.

President's Message

Transitions: What Next for CalEPPC?

Mike Kelly

February 8, 2000 the CalEPPC Board of Directors met for a one-day retreat — fittingly at the Marin Headlands — to take stock of where we were and where we thought CalEPPC should go next. The Marin Headlands, besides being a beautiful place to hold a meeting, is part of the Golden Gate National Recreation Area. It's where Greg Archbald and other activists first explored forming a California Exotic Pest Plant Council. It's also home to one of the worst infestations of *Deleria odorata* (Cape ivy), a reminder of our challenges whenever we strolled the grounds.

We want to share with our members the conclusions we came to and the new goals we set for the organization. We want your feedback on these goals and, of course, your active involvement in translating them into solid accomplishments. Let's look at our accomplishments to date, acknowledge a short-coming, and lay out our priorities for the next period in our evolution.

Accomplishments and shortcomings

First, there was broad agreement that CalEPPC has gone about as far as it can with just a volunteer-based organization. We've accomplished a lot:

- excellent annual Symposiums;
- Symposium Proceedings;
- quarterly newsetter;
- the CalEPPC List — Exotic Pest Plants of Greatest Ecological Concern in California;
- *Invasive Plants of California's Wildlands*, a field handbook for wildland weed identification and control methods;
- a much improved and content-rich Web site;
- funding of major research such as the Pampas grass projects and Cape ivy biocontrols;
- establishing CalEPPC as the leading authority on wildland weed impacts and control methods;
- Strategic partnerships with the California Native Plant Society, the California Dept. of Food and Agriculture, USDA-APHIS, State Parks and others;
- First steps to forming a national coalition of EPPCs.

Our most important shortcoming? Our newsletter. This is something I take personal responsibility for. As the incoming president, I pledged to bring the CalEPPC News out on the regular, quarterly basis it should be on.

I took on the editorship to make it happen and failed to accomplish this important goal. It's embarrassing to me personally, because I consider it a very important way of communicating with you, our members, and of educating a broader public about our goals and campaigns. We'll do better from now on.

You have an important role to play by sending us your articles. They can be research you've done, successes and failures with certain weeds or approaches or tips on control methods such as Jo Kitz's in this issue on *Ailanthus altissima*. You can also send us weed abstracts from other Journals to share with our readers. I find this an invaluable part of Ecological Restoration, formerly *Restoration and Management Notes* (SER), for example.

Our newsletter needs to be improved in other ways. We have not used the newsletter to inform you of the organizational side of CalEPPC as much as we should have. We have also made the mistake of not reporting important things that occur at our Symposiums in the newsletter, forgetting that perhaps only a third of our current members are able to attend any given Symposium.

Two major conclusions were reached

The Board agreed we've probably hit the "wall" for what volunteers can do. Future Cape ivy funding, \$125,000 a year for perhaps 8 more years as compared to our initial funding level of \$60,000 a year, is a good example of the challenges ahead. We felt such challenges are beyond us at our current level of functioning. We spent much of the day defining future priority projects and the funding it would take to make them happen and what organizational changes would be needed. Two big conclusions were reached.

1. We need to plan for hiring an Executive Director in the not too distant future. The cost would probably be about \$35,000 per year for a part-time person; \$65,000 for a full-time Executive Director, plus the expense of setting up or sharing an office. A lot of money, but necessary to take us to a new level of professional functioning.
2. We need to hire the services of a fundraiser/grant writer who can take our projects to private foundations and win funding. We estimate needing \$10,000 – 20,000 per year for this person.

Continued on Page 15

New Wildland Weed Field Manual Is Out

The much anticipated *Invasive Plants of California's Wildlands* is finally in print! Until now, wildlands managers and weed activists have had to rely on an agriculturally oriented manual, albeit a classic, *Weeds of the West**, to identify weeds. This volume is excellent for identifying weeds, many of which are problems in wildland areas. Where *Weeds of the West* stops at helping the reader identify weeds, *Invasive Plants of California's Wildlands* goes beyond this to describe the ecological impacts of the weed and details methods of controlling it. It's this latter information that will make this manual an invaluable guide to the person wanting to know how to get rid of a particular weed in order to protect California's wonderful diversity of plants and animals. Former CalEPPC presidents, John Randall and Carla Bossard are two of the editors of the new publication. Read on for more information about this new book from UC Press and see our Special Offer. — Mike Kelly

"Invasive non-native plants threaten native species with habitat loss, displacement and severe population declines, thus seriously reducing biodiversity. Invasive Plants of California's Wildlands is a tremendous source for land managers and others who are interested in protecting the rich natural heritage of California and surrounding states." — John C. Sawhill, President and CEO, The Nature Conservancy

The editors of *Invasive Plants of California's Wildlands* are: Dr. Carla C. Bossard, Associate Professor of Biology, St. Mary's College of California; Dr. John M. Randall, Director of Wildland Invasive Species Program at The Nature Conservancy and co-editor of *Invasive Plants: Weeds of the Global Garden* (1996); and Marc C. Hoshovsky, a senior conservation biologist for the California Department of Fish and Game. Production of the book was partially underwritten by a grant from the U.S. Fish and Wildlife Service and another from the California Exotic Pest Plant Council (CalEPPC).

Invasive plants are now widely recognized as posing threats to biological diversity second only to direct habitat loss and fragmentation. California's

invasive plant problems are varied, widespread and severe. The focus of this book is on the non-native plants that invade parks, preserves, and other wildlands in California, but the real concern is the survival of the native plants, animals and biological communities these invasive plants threaten. Some invasive plant species inflict such serious damage that unless they are controlled it will be impossible to preserve viable populations of many native species or many of the states natural communities and ecosystems.

However, many plant invasions can be halted or slowed and in certain situations, even badly infested areas can be restored. Hence, weed control and restoration are now regarded as necessary in many wildlands in California and worldwide. This book is intended to help land managers, volunteer stewards and others concerned with California's wildlands to recognize some of California's most damaging wildland invasive plants, better understand their impacts, and minimize the damage they do.

Chapter summaries:

Chapter one provides a brief overview of the impacts of invasive plants and what we know about the characteristics of plant species most likely to invade and the habitats and communities most likely to be invaded.

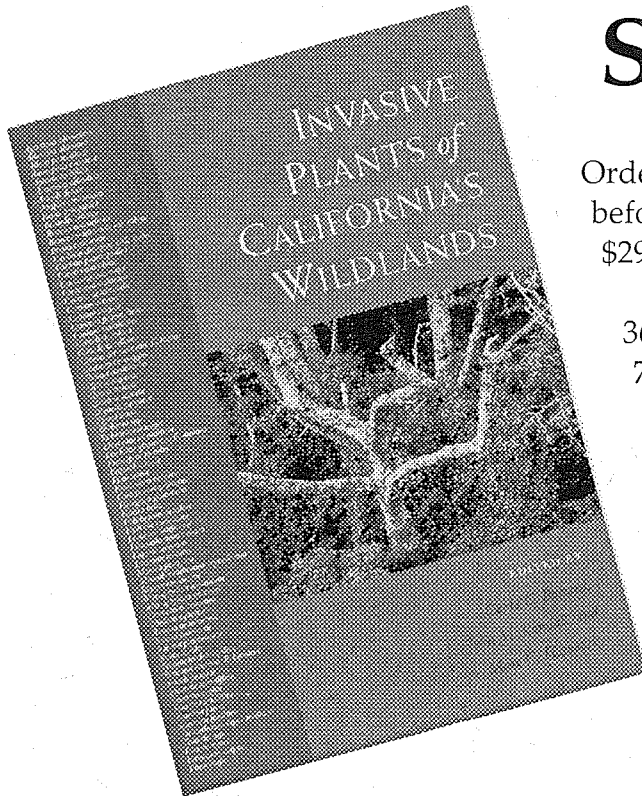
The second chapter features an overview of the strategies and methods appropriate for the control of invasive plants in parks, preserves and other wildlands.

The heart of the book is the remaining chapters which consists of species accounts for seventy-eight invasive non-native species that threaten California's wildlands. These species are listed by CalEPPC as being of greatest ecological concern in California. Each account helps the readers to identify the species, understand important aspects of its biology and lists specific control methods that are regarded as effective.

Other unique features: Each species is illustrated with closeup and habitat pictures and line drawings showing details to aid in identification. The text relates important features of each species ecological traits, methods of spread, reproduction, phenology and control.

*5th Edition, 1996, The Western Society of Weed Science, POB 963, Newark, CA 94560.

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Invasive Plants of California's Wildlands – Addendum

Species Name Index (Common, Scientific, and Synonymous Names)

[The following index was inadvertently omitted from the *Invasive Plants of California's Wildlands* book. Copy this index and keep it with your copy of the book. It can also be downloaded from www.caleppc.org. We apologize for the inconvenience.]

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Instructions for Collecting and Submitting Exotic Plants for Identification

Ellen A. Dean, UC Davis Herbarium and G. Frederic Hrusa,
California Dept. of Food and Agriculture

Imagine that you are out walking in what you believe to be pristine forest, and you see what you think may be a newly introduced weed – what should you do? A new partnership between The California Exotic Pest Plant Council (CalEPPC), the California Department of Food and Agriculture (CDFA), The University of California at Davis (UCD) and The University of California at Riverside (UCR) provides help and information for those who need it. The following article is a summary of how to submit specimens for identification.

The identification program

Andrew Sanders (UCR), Fred Hrusa (CDFA), and Ellen Dean (UCD) have volunteered to identify samples of unknown weeds submitted by CalEPPC members. We already perform plant identifications as part of our job -- Fred mainly identifies plants sent in by CDFA agents, while Andy and Ellen do so for UC Cooperative Extension and university affiliates, as well as the general public. We see the CalEPPC plant identification program as more than us providing a plant identification for you. We would like you to participate in an activity that will provide lasting benefit to Cal-EPPC, the state of California, and the scientific community. We are asking you to provide us with herbarium-quality specimens that will be permanent vouchers of any collection information that you send us. These specimens will be deposited in the UC Davis Herbarium, the UC Riverside Herbarium, or the CDFA Herbarium, depending on where you send the specimen for identification.

Now, you may be asking, what is an herbarium specimen, and what is its value? Herbarium specimens (Fig. 1) are dried and flattened plants mounted with archival glue onto 11 x 17 inch archival paper; also attached to the paper is a label (Fig. 2) that contains data on the plant such as where and when it was collected. Herbarium specimens prepared with archival materials can last for centuries. They are the basis for all work done on plant classification and identification around the world. If you open a flora – for example the most recent flora of California, the Jepson Manual (Hickman 1993) – all the plant measurements and distribution information given for each species in that book were taken from herbarium spec-

imens. Each specimen can be thought of as a slice of history that can be viewed and used by the general public and scientific community at any time.

The goal of our program is to create herbarium specimens from the plants and collection information that you send us. Once your specimens are deposited in an herbarium, they will serve as a lasting record of your work. You will preserve not only the plants that you collected, in case questions about their identity crop up at a later date, but you will preserve your collection data in the form of specimen labels. Your specimens may document the first collections of newly introduced exotic plants, and the data you collect will help us track their distribution and hopefully their eradication.

How to collect plant specimens:

I. What parts of the plant and how much should you collect?

In terms of what plant parts you should collect, you need to send us a representative sample of the plant. Usually, this means just one plant, but if it is a very small plant, we may need five or six, to have sufficient material to dissect. In addition, keep the following points in mind:

1. In general, flowers and fruits are important for identifying most plants, because identification keys emphasize those parts. Therefore, please try to collect flowers and/or fruits (even flower buds can be helpful, if flowers are unavailable). Note: If you have reason to suspect that you are collecting an invasive exotic plant species, be careful not to spread the seeds or other propagules, during the collection process.
2. For some plants, underground parts are important for identification – this is especially true of grasses, sedges, ferns, and lilies.
3. If the plant is small, you will be able to collect the entire plant, including roots. If the plant is large, you will only be able to take selected parts, and you will have to choose those carefully. With trees and shrubs, you will need to clip off a representative branch. A piece of the bark is sometimes helpful as well. If you are sampling a large herb, make

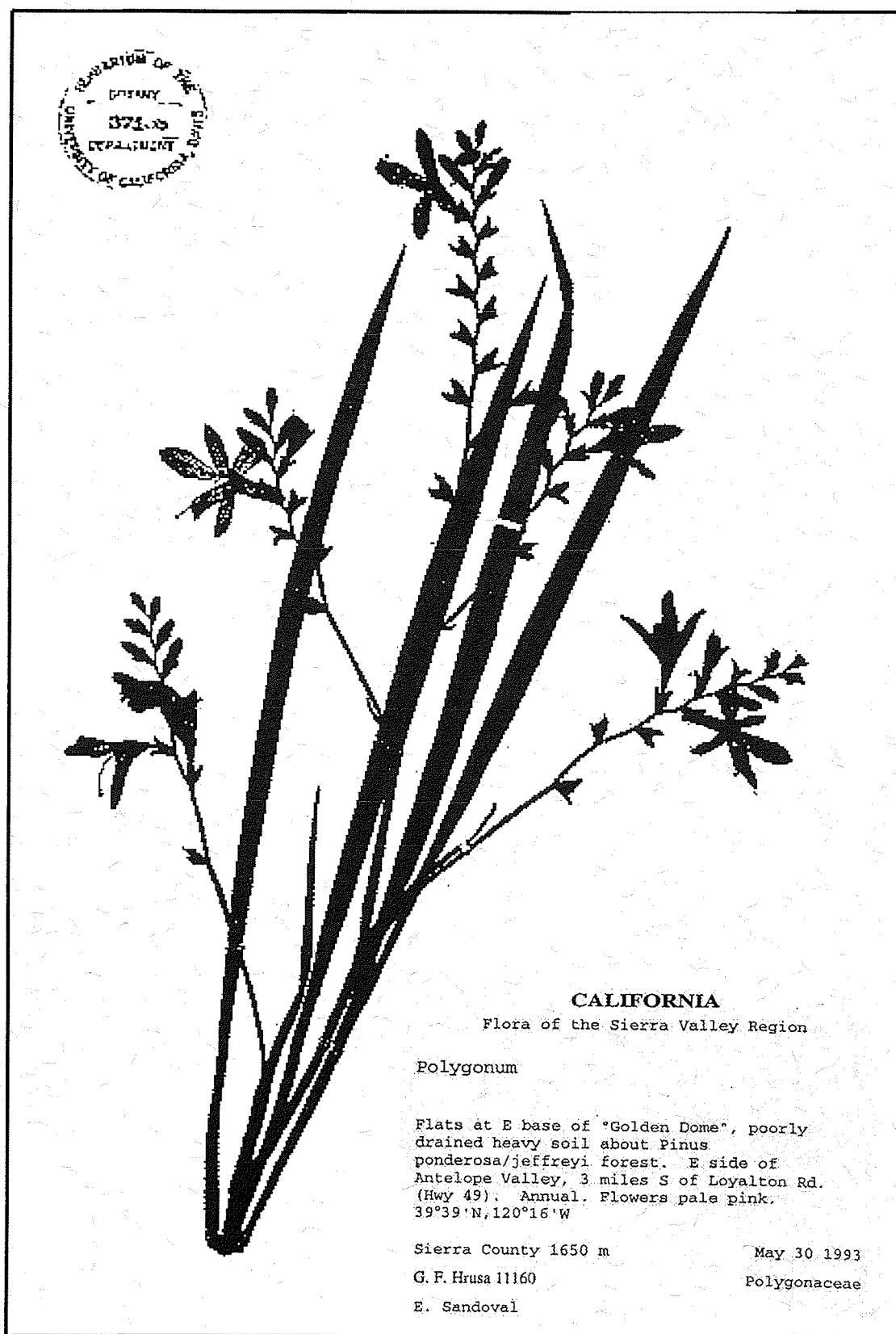


Fig. 1. Xerox of a photograph of an herbarium specimen.

sure that you have pieces of the plant that are representative of the total variation in leaves and stems on the plant. Sometimes lower leaves are very different than upper leaves, and both may be important in identification. You may want to sample the plant from the base, middle, and tips.

II. Collecting equipment and data collection

At a minimum, the general collecting tools that you will need are clippers, a digging tool, plastic bags, data collection sheets, a writing tool, and a plant press. If you want very exact location data, a GPS unit is needed.

Your plant press (Fig. 3) will consist of two pieces of wood, 2 straps, and layers of cardboard, blotting paper, and newspaper. The plant specimen to be pressed is placed in a single-thickness of folded newspaper that is no larger than 11 x 13 inches (when folded). Any plant that you collect needs to fit in

that space within the folded newspaper. On either side of the newspaper is placed a single sheet of blotting paper, and to the exterior of these sheets of blotting paper are placed cardboard. Thus, within the wooden press, the parts alternate as follows: cardboard, blotter, newspaper with specimen, blotter, cardboard, blotter, newspaper with specimen, blotter, cardboard, etc., until one reaches the bottom of the press. The straps hold the press together and are pulled tightly and secured, so that the plants within the newspapers are pressed flat. Some herbaria rent presses, if you need to borrow one.

We have provided a sample data sheet that has blanks to fill out (Table 1). Each plant species that you collect should be assigned a unique number that we can use when we communicate about the specimen; you should write the unique number on both your data sheet (in the blank provided) and on the newspaper that contains the plant in the plant press. Next, record the date of the collection in the proper space. Finally, there are instructions on the data sheet as to what type of locality, habitat, and plant description data are important. At a minimum, we need good locality data. Plant data such as height (for large plants) and flower color (a characteristic that can change as the plant dries) are also important.

III. How to press a plant

As mentioned above, if the plant that you are collecting is relatively small, you can collect and press the entire plant (folding the plant if necessary to fit in the 11 x 13 inch space). Make sure that some leaves face up, while others face down. Spread out the parts, so that leaves lie flat and flowers are pressed open. If you need to collect a large herb, for example a 5 ft tall herb, this is how you might go about it. First, clip a stem of the plant at ground level. Then use your clippers to cut the stem into sections – selecting the better stems that have flowers and or fruits and good leaves. Select sections of the stem that show how the leaf varies from the base of the plant to the top. If you end up with more material than will fit into one folded newspaper, then put the pieces of the plant into several folded newspapers, marking each newspaper with the same unique number. If you don't want to take your press to the field, you can place your plant specimens in plastic bags (writing the unique numbers on the bags) and put the plants in your press later in the day.

Once your plants are in your press, you need

CALIFORNIA

Flora of the Sierra Valley Region

Polygonum

Flats at E base of "Golden Dome", poorly drained heavy soil about Pinus ponderosa/jeffreyi forest. E side of Antelope Valley, 3 miles S of Loyalton Rd. (Hwy 49). Annual. Flowers pale pink. 39°39'N, 120°16'W

Sierra County 1650 m

May 30 1993

G. F. Hrusa 11160

Polygonaceae

E. Sandoval

CALIFORNIA

Flora of Snake Lake Vicinity

Sanicula

Occasional individuals on lightly shaded slopes and somewhat open sites in coniferous forest surrounding Snake Lake. Perennial, flowers yellow. 39°58'N, 120°59'W

Plumas County 1250 m

May 30 1993

G. F. Hrusa 11138

Apiaceae

E. Sandoval

Fig. 2. Examples of two herbarium specimen labels made by G.F. Hrusa.

to tighten the press and leave it in a warm, well-ventilated area. This can be as simple as leaving it in a warm car, or you can leave it on its side in front of a fan. Check your plants every few days to make sure that they aren't molding. Plants with thick leaves and stems can take a long time to dry, and you may have to change the blotters in the press. Normally, plants take from 3-5 days to dry. Re-tightening the press after a day or two can improve specimen quality.

Sending your plant samples for identification

Your dried plant samples can be sent through the mail for identification. Place your data sheets inside

the folded newspapers of the appropriate plant specimens, then bundle your specimens together tightly between cardboard. Place the cardboard bundle inside of a box with padding around it. Make sure that you filled out your contact information on the data sheets, so that we know how to get hold of you. Usually, we can identify the specimens within a week of receipt, however, there may be times when we are out of town or teaching. If you don't hear anything from us for several weeks, then you should contact us to find out if we received the specimens.

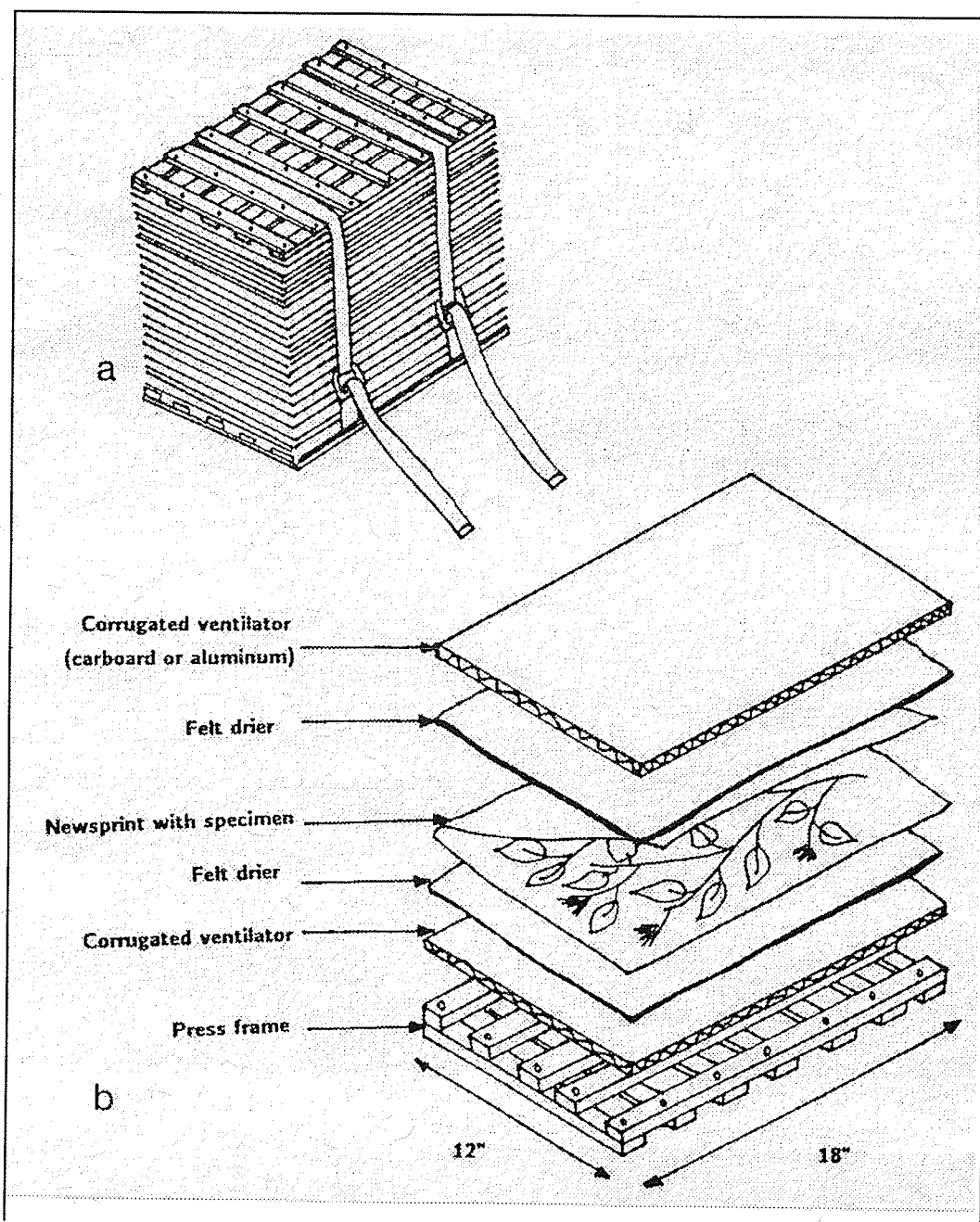


Fig. 3. Illustration of a plant press and its component parts. Illustration taken from Miguel N. Alexiades, 1996. "Standard techniques for collecting and preparing herbarium specimens," in *Selected Guidelines for Ethnobotanical Research, A Field Manual* (M.N. Alexiades, editor), The New York Botanical Garden Press. Used with permission.

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Manual: Higher Plants of California.
Univ. of Calif. Press, Berkeley.

Drilling Ailanthus

Jo Kitz

[Many people have found *Ailanthus altissima* (Tree of Heaven) difficult to control. Cutting it down and applying an herbicide to the cut surface often proves ineffective. Resprouting is common. Jo Kitz here shares a technique she uses in the Santa Monica Mountains that seems to be effective, with minimal resprouting — editor.]

Drilling a single hole into an *Ailanthus* and filling it with Roundup Pro® (Monsanto) has proven effective as a control method. Using a 1/2" drill bit, a hole about 3" deep was drilled and filled with the Roundup® concentrate without dilution. This creates a well of herbicide. The hole was drilled at a 45-60° angle downwards.: the biggest one was probably 6 inches across.

Drilling took place in August and included individual plants as much as 6" in diameter. Drilling as low as possible on the trunk brings the herbicide that much closer to the roots for quicker translocation. Suzanne Goode was perhaps the first person we know of to have used this technique — on White Oak Farm.

Visiting one grove a week later, the *Ailanthus* was already dying. In fact, one untreated tree had turned yellow. Since it's a clonal plant, apparently there was enough herbicide delivered in the "well" to translocate into clonal sections of the root system. On several stumps 1/2 dozen gnarled resprouts were easily scraped off the truck. This stands in contrast to other situations where the cutstump method was used, where numerous shoots would come up from every rootlet.

Data Sheet for Plant Collections

INFORMATION ON COLLECTOR:

Collector's name: _____ Collector's email or preferred
method of contact: _____

INFORMATION ON PLANT COLLECTION:

Unique Number: _____ Date of plant collection: _____

LOCATION (IN U.S.A.) WHERE PLANT COLLECTED:

State _____ County _____

Township/Range: T _____ R _____ Sect. _____, _____ 1/4

Quadrangle Map: _____

or

Latitude/Longitude: _____° _____', _____" N; _____° _____',
_____° W or E Elevation _____ feet or meters (circle one)

Exact Location in words, giving "road distance" (using your odometer) or "as the crow flies distance" (using a map) from a major landmark or road intersection.

Be as specific as possible. Rather than using a term such as "near", use the terms "west of", "south of", etc:

HABITAT: Give information such as slope, aspect, soil type, plant community type, dominant plant species, associated species, moisture level, light level:

PLANT DESCRIPTION: Give information such as abundance, flower color, pollinator type, plant height, habit, life form (annual or perennial herb, shrub, etc)

CONTACT INFORMATION: Send this sample to: Ellen Dean, Plant Biology, UC Davis, CA 95616; or Fred Hrusa, Botany Laboratory, Plant Pest Diagnostics Center, 3294 Meadowview Rd., Sacramento CA 95832-1148; or Andrew Sanders, Botany and Plant Science Dept., UC Riverside, Riverside, CA 92521-0124.

IDENTIFICATION (for Herbarium Use Only):

Family _____ Scientific name: _____

Common name: _____

Is this an introduced species of concern?: _____

Table 1. Sample data sheet for label data (to be filled out at the time a plant is collected).

BLM Uses Heavy Equipment To Give Weeds the Heave-ho!

Jennifer Wheeler, Botanist, Arcata F.O.

The Bureau of Land Management has completed a harrowing assault on invasive weeds located in the southeastern portion of the 40-acre Endangered Plant Protection Area located within the Samoa Dunes Recreation Area across from the welcome kiosk and caretaker station.

This past August, approximately 6 acres of infested and altered dune mat underwent major restorative therapy. The first wave of attack involved bringing out the big guns for the initial step of restoration: removal of about 2.5 acres of annual grasses (predominately *Bromus mollis*) mixed with yellow bush lupine (*Lupinus arboreus*), periwinkle (*Vinca major*), iceplant (*Carpobrotus edulis*), blackberry (*Rubus ursinus*), and English Ivy (*Hedera helix*), as well as 6 inches of duff or more in cases where historical spoils had been dumped in the area by heavy equipment.

The refuse was buried 10-feet under with the aid of an expert excavator operator, hired and supervised by Redwood Community Action Agency (RCAA) via cooperative agreement with the BLM. The bulk of the work was completed with the use of a midsize excavator which allowed for fast and efficient removal and burial of degraded sand and weeds, and also the resculpting and spreading of sterile sand with little or no disturbance to native plant species. No native, intact dune mat was traversed with the heavy equipment, and no native plants were harmed.

To complement the heavy equipment achievements, the BLM commissioned hand crews supplied

by the California Conservation Corps (CCC) for two weeks to treat the transition zones between moderately infested areas and more pristine dune mat, as well as to ensure that the fine, detailed weed removal that the heavy equipment couldn't address was treated. The CCC's performed the more delicate surface sculpting, weeding and duff removal, and reseedling of bare sand areas with native coast buckwheat (*Eriogonum latifolia*), as it was the only native with mature seed at the time.

The project was made possible by an internal competitive grant process made available by the Director of the BLM known as the Director's Field Incentive Award. Arcata Field Office was awarded \$25,000, the maximum amount possible. The funding was split between RCAA who supplied the heavy equipment and related field supervision over a continuous period of 6 days, and the CCC who supplied the hand labor and related supervision for a total of 2 weeks.

The project will be closely monitored for native plant reestablishment success, and if necessary, transplantation of native species from adjacent dune mat communities, and springtime follow-up including hand weeding will be carried out.

This rare habitat is home to two endangered plants including Humboldt Bay wallflower (*Erysimum menziesii* ssp. *eurekaense*) and beach layia (*Layia carnosa*).

For more information about this project, call the Arcata BLM at (707) 825-2316.

\$5 Million for WMAs!

There was good news on the weed war front from Sacramento this summer. Governor Davis signed into law, Senate Bill 1740, providing \$5 million in funds for the State's Weed Management Areas (WMAs). This is a one time funding that is expected to be available as grants over several years. WMAs are coalitions of weed stakeholders and the local County Dept. of Agriculture. Stakeholders include a diverse range of groups from the Cattlemen's Association to the California Native Plant Society to the Rocky Mountain Elk Foundation.

This funding follows on the heels of the modest funding, some \$200,000 that accompanied the earlier Assembly Bill 1168, destined to be given out over a 3-year period, 1999-2002. Fifteen percent of the \$200,000 was earmarked for research, with the remainder to fund a number of small pilot projects in selected counties "to demonstrate the effectiveness of cooperative weed control projects."

While Yellow Starthistle infestations in rangelands provided the initial impetus for various legislators to author the legislation, it's not the only weed a Weed Management Area can focus on. Other A-rated weeds, in fact, must be included as statewide priorities for any county with these weeds. In practice, a number of weeds are being focused on. Educational brochures brought out by some WMAs typically include a broad range of weeds: agricultural, rangeland and wildlands.

Grants have to be matched by cash or in-kind contributions. Several WMAs have been successful in acquiring other grants and funding. AB1168 and the new SB1740 funds are not meant to simply substitute for a local County's "business as

Transition cont'd from page 3.

Research and educational priorities

We want to step up our funding for research to be able to support 5 projects at any given time, including:

3. Cape ivy biocontrol research, about to enter its fourth year where the first insects will probably be brought back to U.S. labs from the current overseas labs in South Africa. We know we'll need about \$125,000 per year for 5-8 years more research. The Agricultural Research Service has decided to recognize CalePPC's commitment by funding the lead scientist at the Albany APHIS Lab. This will help reduce the overall program costs a bit.
4. International Broom Control Initiative, \$100,000 per year for 10 years. Our President emeritus, Mike Pitcairn has taken this on as his project for the Board. Working with an ongoing partnership in Australia and the Pacific Northwest, the goal is to research biocontrols for all the brooms and gorse.
5. Research/training contracts for students/scientists, \$100,000 – 300,000 per year. We'd like to be able to fund a number of graduate student/post-grad positions for research into wildland weeds.
6. Weed mapping and regional weed lists. We need \$6,000 per year for 2 years for interns and \$20,000 per year for 2 years to digitize and map existing weed information and databases. \$7,000 more for printing regional weed maps and lists. That's about \$60,000 over a 2-3 year period.
7. Education. Carla Bossard and Carrie Benefield are now finishing up a K-12 educational poster set on invasive weeds for statewide distribution. We'd like to fund 3 interns at \$15,000 per year to develop educational programs; \$10,000 for a K-12 video.
8. Regionalized weed guides, similar to a couple already brought out by Weed Management Areas, are a high educational priority. These would cost \$10,000 – 12,000 each for development and printing.
9. Alternatives list: what to plant instead of invasives. We have a committee working on this since it's a common question, what do I plant when I get rid of x,y, z weeds? These would cost about \$30,000. to research, develop and print.
10. Increase the authoritativeness of our weed list by including a "transparent" list of our selection criteria, so people who want to use it know it's not arbitrarily concocted from somebody's "pet peeve" weed. We also want to more aggressively

reach out to wildland managers and decision makers with our lists.

11. Increase our cooperation with the nursery industry. To this end, Board member Carl Bell has already initiated useful contacts and exchanges of information. In Florida, this led to a joint agreement on a list of wildland weeds the industry would no longer market.
12. Increase our educational outreach to other environmental groups such as the Sierra Club to improve awareness of the importance of controlling invasive weeds.
13. Strengthen our ties with a National EPPC.
14. Increase CalePPC's involvement with Weed Management Areas, perhaps by encouraging our members to participate in their local ones as CalePPC members.

Other goals included hiring a part-time lobbyist in the future, much as CNPS now has; explore developing a peer-reviewed journal, believing the existing ones to be too devoted to agricultural weeds; develop programs for Public Access TV such as additional Leif Joslyn videos; increase our membership and its involvement in the organization; Whew! Quite a list What do you think? Send your thoughts to mkellysd@aol.com. Let me know if one of these projects excites you enough to want to be involved on. Let me know of your fundraising ideas or of good grant-writers/ fundraisers you can recommend.

WMAs cont'd

usual" weed work. The broad nature of most WMAs helps militate against this. The California Dept. of Food and Agriculture (CDFA) has also refused to fund WMAs that don't bring innovative proposals to the table. It was also decided that to divide such a modest amount, \$200,000, among all the WMAs would dilute any potential results too much. The emphasis was to fund a smaller number of projects that could produce demonstrable results for legislators, to help promote additional funding — which is now a reality.

AB1168 stipulated that an "Oversight Committee" should be set up to advise the CDFA in administering the program. That committee has one representative each from the following interests: livestock production, agricultural crop protection, forest products industry, CalePPC, research institutions, wildlife sports groups, environmental groups (CNPS was chosen), resources conservation districts, general public. SB1740 added one person from the Calif. Dept. of Fish and Game and one person from local politics to the Oversight Committee.

2000 CalEPPC Membership Form

If you would like to join CalEPPC, please remit your calendar dues using the form provided below. All members will receive the CalEPPC newsletter, be eligible to join CalEPPC working groups, be invited to the annual symposium and participate in selecting future board members. Your personal involvement and financial support are the keys to success. Additional contributions by present members are welcomed!

Individual

- ☐ Low Income* \$15
☐ Regular 30
☐ Family 40
☐ Contributing 50
☐ Sustaining 100
☐ Lifetime 1000

Institutional

- N/A
☐ Regular \$100
☐ Contributing 250
☐ Patron 500
☐ Sustaining 1000

* Includes students

Please make an additional contribution in my name to:

Student/Low Income membership \$_____

Cape Ivy Biocontrol Fund \$_____

Please make your check payable to CalEPPC and mail with this application form to:

CalEPPC Membership
c/o Sally Davis
32912 Calle del Tesoro
San Juan Capistrano, CA 92675-4227

Name _____

Affiliation _____

Address _____

City/ State/ Zip _____

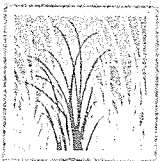
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Home Phone _____

Fax _____

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*Students, please include current registration and/or class schedule



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