# Ecesis

SERCAL
California Society for Ecological Restoration

**ecesis** *I-'se-sus, i-'ke-sus*\ noun [from Greek *oikesis* meaning inhabitation]: the establishment of an animal or plant in a new habitat.

**The Quarterly Newsletter of the California Society for Ecological Restoration**
**Winter Solstice 2007** ***Volume 17, Issue 4***

## In this issue:

### Conference Highlights



### Plus…



*Ecesis* is published quarterly by the California Society for Ecological Restoration, a nonprofit corporation, as a service to its members. Newsletter contributions of all types are welcome and may be submitted to any of the regional directors (see p. 3). Articles should be sent as a word processing document; and accompanying images sent as jpg or tif files.

ABOVE SERCAL Director & Conference Aficionado, Harry Oakes, embarks on the long-awaited Salton Sea fieldtrip… did he spot the elusive yellow-footed, rufous-capped, green-winged bandersnatch?

Thank you to all those who attended the 14th Annual SERCAL Conference in San Diego under difficult circumstances. By all measures the conference was a complete success. For this issue, Past President Mark Tucker has collected papers from some of our conference presenters. A special *thank you* to all the presenters and sponsors for contributing to a successful conference. *Enjoy & Happy Holidays!*

**Figure 5**

# Controlling costs during Arundo and Tamarisk removal on Putah Creek and Cache Creek

*Andrew Fulks, Manager, UC Davis Putah Creek Riparian Reserve and Secretary, Tuleyome, Inc.*

As a land manager, I'm constantly faced with weed control problems that appear to be much larger than available budgets. As an environmental advocate with a non-profit group, my desire to complete weed control projects always exceeds available funding. After completing numerous Arundo and Tamarisk control projects, I've found that contractors average $5000/acre for hand labor to remove these two weeds. Based on the average density of plants on these projects, removal has cost approximately $195 per plant. Herbicide costs are then added to the total. For public land managers and private non-profit groups, these costs can present a hurdle to beginning or completing much-needed weed control projects without outside grants or other funding.

I've found ways to stretch available dollars to eradicate small infestations of Tamarisk and Arundo that have yet to form dense monocultures. My methods to reduce overall eradication costs include using free or

*continued next page*

# Controlling Costs

*continued*

relatively cheap software, substitution of mechanical equipment for hand labor, temporarily borrowing equipment from partner agencies, using volunteer labor on small infestations, and relying on proven herbicide mixes that are potent enough to reduce retreatment needs. We used these methods on two projects on Putah and Cache Creeks (Figure 1) and determined the relative costs of cut stump, cutting and spraying resulting re-sprouts, and foliar spray herbicide treatments.

## Background

Putah Creek begins on Cobb Mountain, in Lake County. It flows through the inner Coast Range, fills and empties from Lake Berryessa, continues past the City of Winters, forming the southern boundary of UC Davis before its eventual terminus at the Yolo Bypass. Cache Creek flows from Clear Lake, through the inner Coast Range and the Capay Valley, into the Central Valley before ending at the Cache Creek Settling Basin, adjacent to the Yolo Bypass. These adjacent watersheds have a variety of groups working collaboratively on invasive weeds throughout their lengths, including tributaries.

The Lower Putah Creek Coordinating Committee coordinates restoration efforts along the lower length of Putah Creek, downstream from Lake Berryessa. UC Davis has management responsibility for approximately 5.5 miles of lower Putah Creek, including a 3.5-mile segment of the Main Campus. It is along this segment where we began our initial weed control efforts.

Tuleyome, an environmental non-profit group of which I'm a founding board member, has adopted the 19-mile 'Wilderness Run' of upper Cache Creek as a Tamarisk and Arundo eradication project. This section of Cache Creek is within a Federal Wilderness Area, as well as designated a State Wild and Scenic River. Tuleyome worked hard for these protections; following up with a stewardship component to ensure the ecosystem was protected beyond legislation.

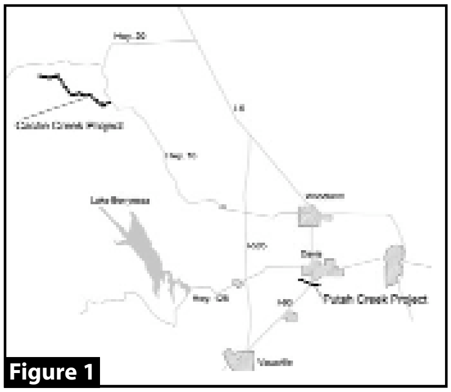



Figure 1

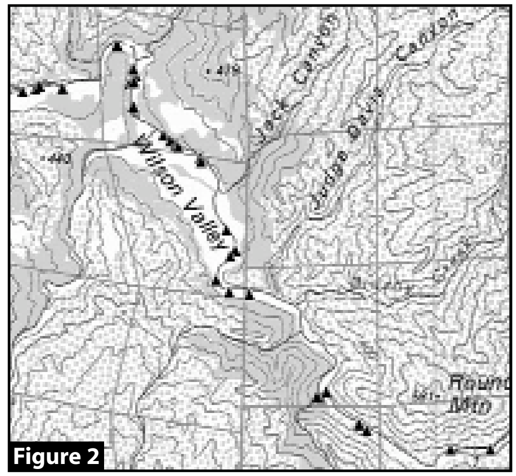



Figure 2

We worked with the California Department of Fish & Game (DFG) and Bureau of Land Management in obtaining permission to do the project on State and Federal lands.

## Project Initiation & Data Gathering

Our primary consideration was to complete both projects as cheaply as possible. This meant we would have to look at all phases of the projects to find ways to reduce or eliminate expenses. This way of thinking began with our initial data collection. Both watersheds have an array of citizen's groups that can be drawn upon for labor and expertise. To do the mapping we either did the data collection ourselves, or enlisted students and volunteers. Since both infestations were comprised of individual plants and clusters of plants rather than vast acreages of monocultures, we were able to use consumer-grade Global Positioning Systems (GPS) to record plant locations. We used both the Garmin Foretrex 101 and Garmin Legend GPS units. Both retail for $130 to $150 and are accurate up to 10 feet. This was more than enough accuracy to record and re-locate the plants during the eradication phase.

Once we had gathered all the point data it was compiled in a spreadsheet. Data included the X, Y, and Z values for each plant, species, height, side of river, and each treatment and date of treatment. This allowed us to track our progress, plan which plants to treat each day, and track herbicide use down to the plant level. We used Microsoft Excel and OpenOffice for our spreadsheet applications, as these were either free or came bundled with purchased computer equipment. This also kept project administration costs to a minimum. To analyze the data, ESRI's ArcExplorer Geographic Information System (GIS) software was used. This software is free to download and use, and provides enough basic GIS functions to be useful for data analysis and to visually display the data (Figure 2).

Initial reconnaissance work determined the amount of infestation on each section of creek. The Putah Creek Reserve had a total of 304 Tamarisk and Arundo plants along 3.5 miles. Cache Creek had 85 plants along 19 miles. These levels confirmed our initial expectation that we could perform eradication without an expensive contract.

## Herbicide Formulation

Working with Joel Trumbo, DFG's Pesticide Use Coordinator, we developed the following herbicide formulation:

5% Aquamaster (Glyphosate)
3% Habitat (Imazapyr)
1.5% Agri-dex (spray adjuvant and surfactant)

Aquamaster and Agri-dex cost under $60/gallon, and Habitat is approximately $280/gallon. While Habitat is expensive, we decided that we would save time if we selected an herbicide that would reduce the amount of re-treatment needed. Minimizing re-treatment needs would allow us to complete each project faster by spending each subsequent year working on new plants, rather than re-doing previous applications.

## Weed Eradication — Putah Creek

After determining the quantity and location of the infestations, we designed the eradication program around access to each plant. The Putah Creek site had relatively easy access for heavy equipment. We arranged to use a small excavator with a

Figure 3

Figure 4

brush-cutter attachment owned by the Solano County Water Agency (Figure 3). The Water Agency and UC Davis are partners on the Lower Putah Creek Coordinating Committee, thus allowing for equipment-sharing. Free use of this equipment substantially lowered our overall costs. The minimal costs associated with the excavator included fuel and grease, and amounted to a few hundred dollars over the life of the project.

For areas that were not reachable by heavy equipment, we contracted with the Yolo County Conservation Corps (YCCP). The YCCP provides a crew of 15 young adults through the Probation Department for $100/hour per crew. Many other counties have conservation crews available and these can be a cost-effective labor alternative. We used the crews to cut and remove plants with hand tools (Figure 4).

Most of the Tamarisk and Arundo plants on Putah Creek were treated by cutting and spraying re-sprouts. Seven of the plants were in areas not safely reachable by heavy equipment or YCCP crews and were treated using a foliar spray by staff. Almost all of the Tamarisk and Arundo on the Main Campus segment of the Putah Creek Reserve was treated during 2006 and 2007.

## Putah Creek Results

Approximately 50% of the plants required re-treatment. However, the re-treatment was usually limited to one or two small re-growths, so the second treatments were of minimal cost. The overall cost for eradication on Putah Creek was $8.88 per plant. This cost included fuel and lubricant for the excavator, herbicide, and the cost of the YCCP crews. The herbicide-only cost was $1.98 per plant.

## Weed Eradication — Cache Creek

Access to the Cache Creek project area was very difficult. The project area is within the Cache Creek Wilderness Area, along a State Wild and Scenic River. The plants are scattered along 19 miles of steep canyons along the river. Access by foot would be near-impossible to some of the plants, and vehicle use is prohibited. By accessing the site via kayak, we could stop at each plant as we progressed downstream (Figure 5). For a contractor, the idea of boating in supplies, equipment, and laborers would be costly and high liability risk. Tuleyome had insurance coverage for our outings program and a volunteer team of experienced kayakers. The use of volunteer labor reduced costs and also doubled as part of our outreach program (Figure 6) and gave the public a stake in the stewardship of the public lands. DFG provided herbicide for use on this and a related project on a Cache Creek tributary; we tracked the herbicide use and costs for annual reporting.

Methods for eradicating the Tamarisk included cut stump, cutting and spraying re-sprouts, and foliar spray without cutting. Arundo eradication methods were the same as for Tamarisk, with the exception of cut stump. The method chosen for each plant was based on

*continued next page*

# Controlling Costs *continued*

Figure 6

accessibility, size of the volunteer crew, and growth habit of the plant. We could determine which method we used based on our initially gathered data. Thanks to the herbicide donation by DFG and the enthusiasm of the volunteers we were able to treat all but one of the plants during the 2006 and 2007 calendar years.

### Cache Creek Results

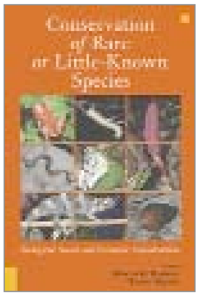
We treated 17 tamarisk using cut stump treatment, where we cut the stump and immediately applied herbicide. The herbicide-only cost for this treatment was $0.41 per plant. Of these plants, 35% required follow-up treatment in 2007, though the follow-up was minimal as the effect of the herbicide was clear in the stunted form of the re-sprouts.
The 46 Tamarisk and Arundo plants treated by cutting and spraying re-sprouts cost $3.82 per plant for the initial treatment. Approximately 50% of these plants required minor re-treatment. Twenty-two plants were treated by foliar application only, with an average herbicide cost of $13.82 per plant.

### Conclusion

Tamarisk and Arundo removal need not be expensive. If the infestations are small enough, cost-effective removal can be accomplished using a combination of citizen's groups, Conservation Corps, borrowed equipment from partner agencies, and judicious use of herbicides. Inexpensive GPS units can help during plant inventories and careful recording of the project progress will allow for GIS analysis and project tracking. Volunteer labor can eliminate up to $195 of labor cost per plant removed. When labor costs are removed from the total cost of eradication, the cost per plant is largely confined to herbicide used. For future projects, these cost numbers can help project managers decide the best method for eradication. If you have access to volunteer or cheap labor, cut stump is the most cost-effective method of tamarisk control, at less than $1 per plant for herbicide. If you don't have access to cheap labor, it can be cheaper to hire an herbicide applicator and use a foliar spray. This will increase the herbicide cost, but is still cheaper overall than hiring a labor crew to cut the plants.

Creative, collaborative, and citizen-based approaches to weed control can help eradicate Tamarisk and Arundo from California's rivers. As land managers and environmental advocates, we have a responsibility to steward the land regardless of the money at our disposal. We have the potential to cut costs and still have great success in our eradication efforts, and hopefully inspire others to do the same.

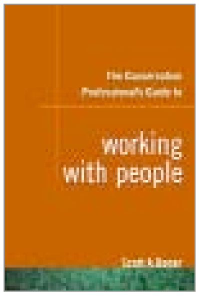
~




### Conservation of Rare or Little-Known Species

Martin G. Raphael, Randy Molina

*Conservation of Rare or Little-Known Species* represents the first comprehensive scientific evaluation of approaches and management options for protecting rare or little-known terrestrial species. The book brings together leading ecologists, biologists, botanists, economists, and sociologists to classify approaches, summarize their theoretical and conceptual foundations, evaluate their efficacy, and review how each has been used.




### The Conservation Professional's Guide to Working with People

Scott A. Bonar

Written in an entertaining, easy-to-read style, *The Conservation Professional's Guide to Working with People* fills a gap in conservation education by offering a practical, how-to guide for working effectively with colleagues, funders, supervisors, and the public. The book explores how natural resource professionals can develop skills and increase their effectiveness using strategies and techniques grounded in social psychology, negotiation, influence, conflict resolution, time management, and a wide range of other fields. Examples from history and current events, as well as real-life scenarios that resource professionals are likely to face, provide context and demonstrate how to apply the skills described.

### Ecological Restoration

Society for Ecological Restoration / Andre F. Clewell, James Aronson

*Ecological Restoration* offers for the first time a unified vision of ecological restoration as a field of study, one that clearly states the discipline's precepts and emphasizes issues of importance to those involved at all levels. In a lively, personal fashion, the authors discuss scientific and practical aspects of the field as well as the human needs and values that motivate practitioners.

### Old Fields: Dynamics & Restoration of Abandoned Farmland

Society for Ecological Restoration / Viki A. Cramer, Richard J. Hobbs

*Old Fields* brings together leading experts from around the world to synthesize past and current work on old fields, providing an up-to-date perspective on the ecological dynamics of abandoned land. The book gives readers a broad understanding of why agricultural land is abandoned, the factors that determine the ecological recovery of old fields, and how this understanding contributes to theoretical and applied ecology.

ISLAND PRESS

Solutions that inspire change.

### Restoring Natural Capital

Society for Ecological Restoration / James Aronson, Suzanne J. Milton, James N. Blignaut

*Restoring Natural Capital* brings together economists and ecologists, theoreticians, practitioners, policy makers, and scientists from the developed and developing worlds to consider the costs and benefits of repairing ecosystem goods and services in natural and socioecological systems. It examines the business and practice of restoring natural capital, and seeks to establish common ground between economists and ecologists with respect to the restoration of degraded ecosystems and landscapes and the still broader task of restoring natural capital.

## Many thanks to our 2007 Conference Premier Sponsor...

# Failure to control annual weeds reduced restoration performance following pipeline excavation project in Mission Trails Regional Park

*J. Carrie Schneider, California Native Plant Society, San Diego Chapter.* 


## Abstract

The San Diego chapter of the California Native Plant Society (CNPS) conducted vegetation surveys to review the results of revegetation activities carried out after a 1995 excavation for a water pipeline project in San Diego's Mission Trails Regional Park (MTRP). Restoration for the project consisted of replacement of topsoil, hydroseeding, and weeding focused primarily on control of perennial species. CNPS found that non-native annual vegetation dominated three out of four of the plots located on the site of the former project. Nearby off-project-site plots were dominated by native species, including woody shrubs such as *Xylococcus bicolor* (Mission manzanita), which were not present in any on-site plot. CNPS concludes that more effective control of annual weeds in the restoration projects would improve the likelihood of re-establishment of native vegetation.


## Introduction

Mission Trails Regional Park is a large (5600 acres) open space park located eight miles northeast of downtown San Diego. MTRP comprises a large part of San Diego's Habitat Conservation Plan known as the Multi-Habitat Planning Area, a major recreation site for citizens to enjoy nature, and is also shared with easements for utilities such as water pipelines. In 1995, the San Diego County Water Authority (CWA) completed a water pipeline project in MTRP, which consisted of excavating a trench, placement of pipe, and revegetation. The CWA has described their onsite revegetation procedures as consisting of topsoil salvage, hydroseeding with straw and a tackifier, and weed control with an emphasis on controlling perennial weeds[i]. In view of a proposal for another pipeline project in MTRP in 2008, CNPS recently surveyed several areas of the 1995 pipeline project to evaluate the long-term performance of the revegetation with the intent to make recommendations for future revegetation projects. A previous survey, focused on mesa tops affected by the project, found that 30-50% of total cover consisted of non-native species[ii]. CNPS focused our survey effort on hillsides affected by the project and control sites adjacent to the project footprint.

## Methods

Permits to enter the area and carry out surveys were obtained from MTRP. Plots (20 x 20 feet) were established at four locations (27, 28, 29, 32) on the revegetated pipeline excavation project, which are referred to as "on-site" (Figure 1). CNPS selected three sites on hillsides, which were not surveyed in an earlier study[ii], as well as one mesa-top site. For comparison, two nearby control plots (30 and 31) were chosen on adjacent hillsides unaffected by the 1995 excavation, which are referred to as "off-site" (Figure 1). The plots were selected to be representative samples of the two conditions with attention paid to compositional and structural integrity — that is, the entire stand in each plot shared approximately the same distribution of species and history. The on-site plots were chosen to sample areas of different aspect (south-facing, north-facing, and relatively level). The off-site plots were located as close as possible to the project footprint to ensure that the sites shared similar soils, microclimate, and non-project history of disturbance. In addition, the off-site plots shared a similar aspect (north-facing slope) with the on-site plots 27 and 29 and a relatively homogeneous habitat type (chaparral). All plots were burned in the 2003 Cedar Fire[iii]. Plots were surveyed in January and February of a relatively dry year[iv]. Because of the low rainfall and the early season, annuals were small and in pre-flowering vegetation phase. The Rapid Assessment Protocol[v] was used to assess vegetation type in the plots, which involved recording the plant species along with a visual estimate of the percent of ground covered by each species assessed by comparison to a printed density map. Teams of two to five surveyors estimated the percent cover in each plot.

## Results and Discussion

The location of the 1995 pipeline excavation is obvious from the aerial view (Figure 1) and also on the ground because of differences in vegetative cover between the pipeline site and adjacent areas. Vegetation surveys showed that two out of four on-site plots had substantially greater cover by non-natives than by native plants (Figure 2), whereas the two off-site plots were primarily covered by native species. The two most disturbed on-site plots (27 and 29) were dominated by the non-native grass *Brachypodium distachyon* at 15% and 30% cover, respectively. Dense stands of dried stalks of invasive non-native mustard (*Hirschfeldia incana*) from previous seasons dominated the on-site plot 32 (Figure 3), and would likely contribute substantially more to the total vegetation cover later in the season, or in a wetter year. Ironically, the on-site plot with the highest ratio of native to non-native species (28) was also occupied by a concrete structure associated with the water line. This plot, at the top of the ridge, was the least steep; it is possible that the hydroseeding that followed the excavation in 1995 was more successful on this plot because the shallow slope retained more water.

A previous survey[ii] also found large percent cover by non-natives (30-50%) on sites impacted by the Flow Regulatory Structure I (FRS I) project, but found that the control plot was also dominated by non-natives. In that study, however, the control plot was located far from the project area on a southwest-facing slope of Fortuna

Mountain dominated with coastal sage scrub. In contrast, our two off-site plots, which were located in chaparral immediately adjacent to the project area, were dominated by native species (Figure 2). In particular, several woody shrub species were present in the off-site plots but not in the on-site plots, *e.g. Xylococcus bicolor* (Mission manzanita), *Quercus dumosa* (Nuttall's scrub oak), *Rhus integrifolia* (Lemonadeberry) and *Adenostoma fasciculatum* (Chamise). *Quercus dumosa* is a CNPS List 1B plant (Plants Rare, Threatened or Endangered in California and Elsewhere). It is unclear whether the excavation impacted this species, because pre-project biological surveys were not available.

## Conclusion

Twelve years after the MTRP pipeline excavation project, the impacts are still obvious in the differences in vegetation — three out of four of the revegetated plots were dominated by non-native vegetation, primarily weedy annuals. CNPS believes that this level of restoration performance is not acceptable for a habitat preserve and Open Space Park, especially because a linear pipeline project has a long boundary and can act as a reservoir to increase weed infestation in the rest of the park

What are the reasons for this low level of performance? In CNPS's experience, the City of San Diego has allowed the impacts on public utility easements to be mitigated by purchasing credits in off-site mitigation banks, while allowing much lower performance standards for revegetation at the project site. The guidelines for "revegetation" are aimed at establishing vegetative cover, not restoration of fully functional native habitats. The large cover by annual weeds may be attributed to the lack of priority placed on control of annual weeds by CWA in their restoration practices[i].

Public dissatisfaction about impacts from sewer infrastructure access in Open Space parks led to a new Council Policy (#400-13) in 2002, which directed another public infrastructure developer, Metropolitan Wastewater Department, to access the infrastructure projects to minimize environmental impacts. Furthermore, conditions for sewer access that were negotiated as part of the City of San Diego's Master Permit covering sewer access could serve as a good standard for other public infrastructure projects in Open Space parks.

The conditions in the sewer access permit include control of perennial weeds to below 1% cover and annual weeds to below 10% cover at two years after installation. The performance standards emphasize establishing vegetation that is similar to adjacent areas, in terms of species and percent weed cover. Actions that are likely to lead to greater performance include weeding for an extended length of time (five years, or until coverage standard are met, is standard for mitigation projects) and an increased emphasis on controlling the persistence of annual weeds (especially *Brachypodium distachyon* and *Hirschfeldia incana* which were predominant), instead of perennials only. Use of container plants may be necessary in order to restore shrubby perennials such as *Xylococcus bicolor, Quercus dumosa, Rhus integrifolia* and *Adenostoma fasciculatum.* Establishment of container plants would also be expected to reduce cover by annual weeds, aiding the restoration. Long-term management and non-wasting endowment accounts would also be expected to increase long-term restoration performance, which is

*continued page 9*

**Figure 1**

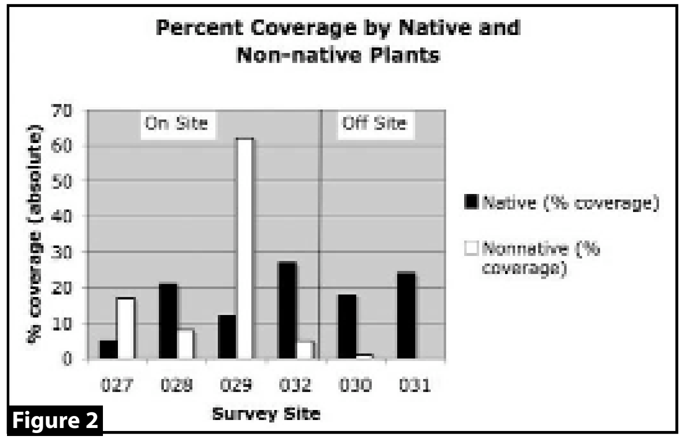



**Figure 2**

**Figure 3**

**Figure 1. Survey sites chosen for this report:** This Google Earth terrain view shows a detail of the 1995 pipeline project in Mission Trails Regional Park (Corte Playa Catalina is the street at the western boundary of the site). The large rectangular site in the middle of the photo is the CWA Flow Regulatory Structure I (FRS I). Four survey plots (27, 28, 29, 32) overlaid the 1995 pipeline project. Two off-site survey plots (30, 31) were near the others but not directly affected by excavation. *Image is used with permission of Google Earth™ mapping service.*

**Figure 2. Extent of cover by native species:** For plant species covering 1% or more of the plot, the sum of cover by native species or non-native species is shown. The four on-site plots are shown on the left side and the two off-site comparison plots on the right. Note that plot 32 was also thickly covered by previous year's dead stalks from non-native mustard, which was not counted as part of the cover but would presumably contribute substantially to the total in a wetter year or later in the season after plants matured (see Figure 3).

**Figure 3. Photograph of plot 32, view to the east:** Dense stands of dried stalks of non-native mustard (*Hirschfeldia incana*) from previous seasons in on-site plot 32.

# Improving culturing techniques for *Eriogonum cinereum* in a nursery setting

*Mike Yadrick (Restoration Director) & Ryan Falconer (Restoration Assistant), Palos Verdes Peninsula Land Conservancy*

As land managers of approximately 1,500 acres of habitat on the Palos Verdes Peninsula, the Palos Verdes Peninsula Land Conservancy (PVPLC) conducts habitat restoration using native plants grown in the PVPLC nursery. Often grown from locally collected seed, and planted within nature preserves, plants grown in the nursery serve to enhance and/or supplement the expansion of native coastal sage scrub (CSS) plant communities throughout the Peninsula. Ashy leaf buckwheat (*Eriogonum cinereum*) is an important component of CSS communities, but has proven frustratingly difficult to culture within a nursery setting. Germination rates are generally high; however, seedlings often succumb to a common downy mildew fungus within a few weeks of germination or shortly after transplantation to a container. In an attempt to develop methods that will produce the greatest number of healthy ashy leaf buckwheat plants, a controlled propagation experiment was conducted using various germination soil mixes and differing fungicide application regimes.

PVPLC staff collected local seed, which was cleaned and spread over approximately 1.5 inches of base soil in germination flats lined with newspaper, and then covered with an additional 0.25-0.5 inches of soil. The flats were watered immediately after seeding. Throughout the experiment, watering was done on an as-needed basis, as determined by nursery technicians. Due to the varying porosity of the soil mixes, some flats required more frequent watering than others. Flats remained on nursery prep tables under shade for the duration of the experiment. Tables lined with one-inch PVC piping were used in an attempt to increase aeration.

Five different soil mixtures were used in a total of 17 germination flats, with each flat receiving a specific fungicide application schedule. Two types of pre-mixed soil blends and one soil amendment (perlite) were used to create the five soil mixtures used in the experiment. Our hypothesis was that more porous soil mixtures would be better for raising healthy ashy leaf buckwheat plants because of soil moisture reduction, which may discourage fungal growth.

Each soil mixture receives at least three different fungicide application schedules. Fungicide is applied to the germination flats at 10-day or 30-day intervals, or not at all. A broad spectrum, Schultz brand 'Garden Safe' fungicide was chosen because it is considered very safe to use. The active ingredient in this particular fungicide is clarified hydrophobic extract of neem oil. Flats are separated during fungicide application to ensure only scheduled soil mixtures are treated. Also, once any sign of fungal infection is detected, the flat is separated from the 'healthy' flats to

*continued next page*

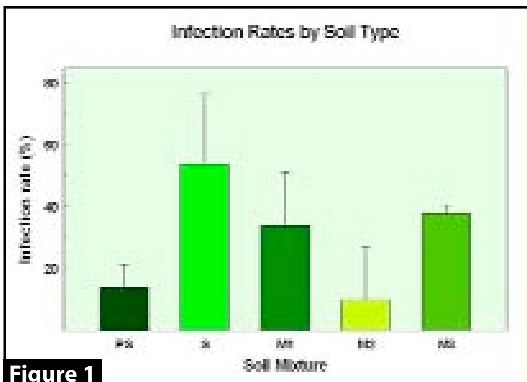



**Figure 1**

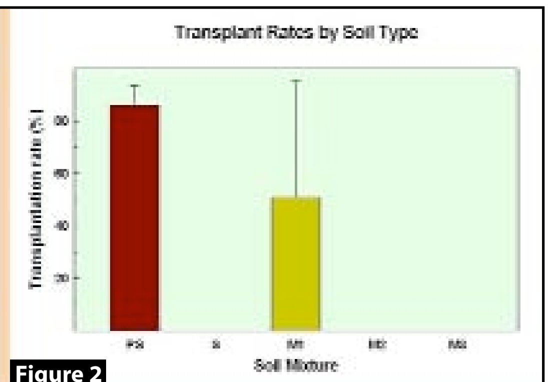



**Figure 2**

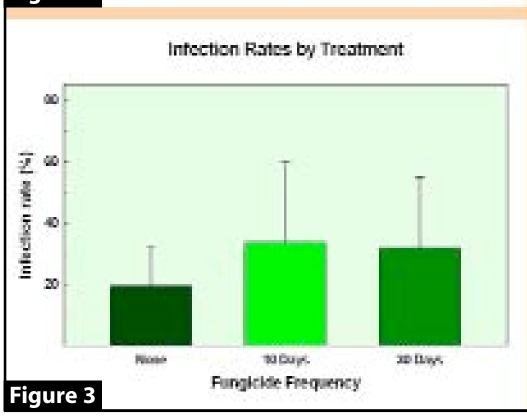



**Figure 3**

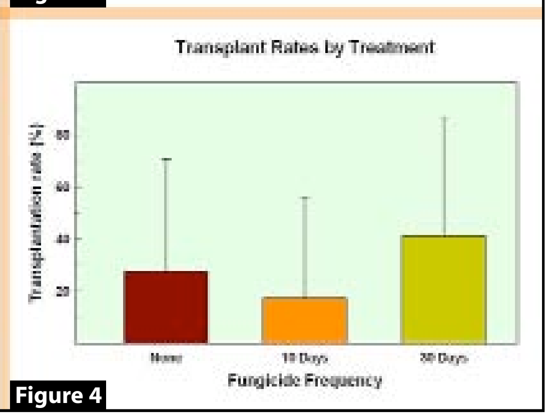



**Figure 4**

**Figure 1:** Infection rates by soil mixture showing the lowest occurring in Potting Soil (PS) and Mix 2 (M2). Results are significantly different when tested by Pairwise multiple comparison ($p<0.05$).

**Figure 2:** Transplantation rates by soil mixture showing only Potting Soil (PS) and Mix 2 (M2) produced transplantable young. Results are significantly different when tested by Pairwise multiple comparison ($p<0.05$).

**Figure 3:** Infection rates by fungicide treatment. Results are not significantly different when tested by one-way ANOVA ($p<0.05$).

**Figure 4:** Transplantation rates by fungicide treatment. Results are not significantly different when tested by one-way ANOVA ($p<0.05$).

minimize the contamination. Regular fungicide treatment and isolation of flats with infected plants may reduce the total number of plants attacked by fungus.

The experiment has been evaluated by determining numbers of healthy and unhealthy germinated ashy leaf buckwheat plants. To further assess ongoing experiment results, fungal infection rates and rates of transplantation to gallon containers are ascertained by soil mix type and by fungicide treatment regime (Figures 1-4). To date, 335 healthy plants have been grown, 185 of which have been transplanted. The optimal soil mixture for low fungal infection and high transplantation has been potting soil from a local grower. Contrary to our hypothesis, more coarsely grained soils have been largely ineffective for germination. Sunshine bagged soil, the most finely textured soil mix, has also proven ineffective. While the optimal fungicide treatment regime is indeterminate, the least effective fungicide treatment regime has clearly been once every ten days. The newly implemented procedure of relocating infected flats anecdotally appears to be a potentially effective protocol. Fungus has appeared in non-isolated flats, but the highest rates of fungal infection occurred in flats that we separated from the others.

Despite these preliminary results, continued investigations are needed in order to achieve a protocol for high-percentage survivorship. We will continue to refine our methods for optimal plant survival, with the possibility of further experimentation in the future, which may include mixing local soil into the growing medium. Other trials will include rotating several fungicides since the mildew present in the nursery may grow resistant to the current chemical used for control. We hope that the results of our ongoing work will benefit the Land Conservancy as well as other nurseries that grow ashy leaf buckwheat for CSS restoration.



Many thanks to our 2007 Conference Sponsors...

## Failure to control annual weeds reduced restoration performance *continued from page 7*

especially critical in large open space parks and reserves. CNPS anticipates that the CWA will take these findings into consideration in the detailed re-vegetation plan currently being developed for the FRS I project.

CNPS also note that the large and unpleasant visual impact of the utility access roads degrades the qualities that the public expects in an Open Space Park. The roads also channel stormwater that accelerates erosion, and annual weeds are abundant on the shoulders. CNPS recommends that these infrequently-used roads be reduced to a single track by establishing container plants along the edges, that weeds be controlled to avoid transfer of seeds into the rest of the Park, and that low-growing native plants and other erosion-control methods be used on the surface of the roads when possible.

**Acknowledgements:** *Thanks to Lexine Schroeder for organizing data collection and to Cindy Burrascano, Patrick McConnell, Bruce Hanson, Garth Wadsworth, Leonard Wittwer, Paul Beiley, Eileen Goff, Coolidge Sharkey, Anthony Cocco, Arne Johanson, Christina Beni*

[i] Cass, T. (2006) "Revegetation following pipeline construction in San Diego County", *Ecesis*, 16[3]: 1-3

[ii] Attachment A, Comparative Analysis of the San Diego County Water Authority Flow Regulatory Structure I Revegetation Site and Selected Coastal Sage Scrub Habitats, Mission Trails Regional Park, Tierra Environmental Services, July 2006.

[iii] map.sdsu.edu/fireweb/images/dave-map2large.jpg; **www.fire.ca.gov/cdf/incidents/Cedar%20Fire_120/incident_maps.html**

[iv] June 2006–May 2007 total was 36% of normal at Lindbergh Field according to the National Weather Service Forecast Office

[v] Sawyer, J.O. and T. Keeler-Wolf, *A Manual of California Vegetation*, CNPS Press, 1995

# Many, Many Thanks to our Members…

## Sustaining

**INDIVIDUAL: $100**

2007 **Albert Knight** *Glendale*

2007 **Peter Warner** California Department of Parks & Recreation *Mendocino*

2007 **Bo Glover** Environmental Nature Center *Newport Beach*

**BUSINESS: $500**

2007 **Tallac Applied Ecology & Design** Gerald A. Dion *South Lake Tahoe*

2007 **Tree of Life Nursery** *San Juan Capistrano*

2007 **Pacific Restoration Group, Inc.** *Corona*

2007 **EcoSystems Restoration Associates** *San Diego*

## Contributing

**BUSINESS: $250**

2007-2008 **Integrated Environmental Restoration Services, Inc.** Michael Hogan *Tahoe City*

2007-2008 **Coastal Restoration Consultants, Inc.** Matt James/Dave Hubbard *Santa Barbara*

2007-2008 **Kamman Hydrology & Engineering** *San Rafael*

2007 **Restoration Resources** Chris Swift *Rocklin*

2008 **Dudek Engineering & Environment** *Encinitas*

2007 **Full Circle Compost** Craig Witt *Minden, NV*

2007 **Ecological Concerns, Inc.** Joshua Fodor *Santa Cruz*

2007 **Prunuske Chatham, Inc.** *Occidental*

2007 **Palos Verdes Peninsula Land Conservancy** *Rolling Hills Estates*

2007 **Chambers Group, Inc.** *Irvine*

2007 **Valley & Mountain Consulting** Virginia Mahacek *South Lake Tahoe*

2007 **Hedgerow Farms** John Anderson *Winters*

2007 **EDAW, Inc.** *Sacramento*

2007 **Hydro-Plant, Inc.** Rob McGann *San Marcos*

2007 **Pacific Coast Seed, Inc.** *Livermore*

2007 **S & S Seeds** *Carpinteria*

2007 **Stover Seed Co.** *Los Angeles*

2007 **Vandermost Consulting Services** Julie Vandermost *San Juan Capistrano*

2007 **RECON Native Plants, Inc.** Ryan West *San Diego*

2007 **Golden Bear BioStudies** *Santa Rosa*

## New! *through 23 November 2007*

**Richard King** NRCS *Petaluma*

**Holly Sletteland** *Templeton*

**Mike Trotta** LSA Associates, Inc. *Carlsbad*

**Joy Fischer** Yosemite National Park, Resources Management & Science

**Michael Bankosh** Midpeninsula Open Space District *Los Altos*

**John Cantion** DuPont *Lakewood, CO*

**James Dempsey** CA Dept. Parks & Recreation *Oroville*

**Robert Hobbs** EcoSystems Restoration Associates *San Diego*

**Brent Johnson** Yosemite National Park

**Nancy LaGrille** CA State Parks, Oceano Dunes SVRA *Pismo Beach*

**Roselynn Lwenya** Tule River Natural Resource Dept. *Porterville*

**Brad Roth** Cottonwood Creek Conservancy *Cardiff*

**Sommer Fisher** TRC Solutions *Encinitas*

**Kristin Teddy** Jones & Stokes *Sacramento*

**Dawn Calciano** Putah Creek Council, *Davis*

**Tucson Audubon Society** Lia Sansom (NPO)

**Linda Farley** Vandermost Consulting Services, Inc. *San Juan Capistrano*

**Greg Omori** Agri Chemical Supply, Inc. *Oceanside*

**Maribel Zamora** RECON Environmental, Inc. *San Diego*

**Starla Underwood** Victor Valley College/AGNR *Victorville*

**Jeannine R. Ross** RECON Environmental, Inc. *San Diego*

**Carla Scheidlinger** Agrarian Research *Bishop*

**Kai Palenscar** UC Riverside

**Mark Dodero** RECON Environmental, Inc. *San Diego*

**Milan Mitrovich** Green Shield Ecology *Irvine*

**Andy Thomson** DUDEK *Encinitas*

**Rebecca A. Alvidrez** Chambers Group Inc, *Redlands*

**Robert Hobbs** EcoSystems Restoration Associates *San Diego*

**Mark Newhouser** Sonoma Ecology Center *Glen Ellen*

**Margaret Bornyasz** M.J. Klinefelter *Valley Center*

**Bruce Casler** *Sacramento*

**Shirley Innecken** RECON Environmental, Inc. *San Diego*

**Peter Dolan** Engineering & Environment, Inc. *Barstow*

**Bill Roper** Wildlands, Inc. *Rocklin*

**Julie Mentzer** Wildlands, Inc. *Rocklin*

**Brian Dugas** Padre Associates, Inc. *San Luis Obispo*

**Joshua Zinn** EDAW, Inc. *San Diego*

**Lindsey Teunis** Aspen Environmental Group *Carlsbad*

**Lynne Baker** Lakeside River Park *Lakeside*

**L. Breck McAlexander** CDFG *San Diego*

**Mike Peters** Fallbrook Land Conservancy

**Tom Hayduk** Envicom Corp. *Agoura Hills*

**Tanya Meyer** Yolo County RCD *Davis*

**Dale Schmidt** Los Angeles Dept. of Water & Power, *Bishop*

**Robert Noll** Noll Seeds *Vista*

**Ingrid Hogle** Invasive Spartina Project *Berkeley*

**Jenny McGee** Chambers Group *Irvine*

**Cris Perez** Newhall Land *Piru*

**Jonathan Appelbaum** Technology Associates *San Diego*

**Allana Summers** *Folsom*

**Shawn V. Petrash** SRWTP Bufferlands *Elk Grove*

# SERCAL 2008 Membership Application/Renewal Form

**Complete form and payment to SERCAL and mail to: SERCAL Administrative Office, 2701 20th St., Bakersfield CA 93301**

## Annual Membership Dues

*SERCAL's newsletter,* Ecesis, *is received with ALL rates.*

**INDIVIDUALS**

| | | |
|---|---|---|
| Student | ❒ | $15 |
| Regular | ❒ | $35 |
| *Joint Individual (Discounted)* | | |
| SERCAL + Cal-IPC† | ❒ | $60 |
| SERCAL + CNGA† | ❒ | $70 |
| All 3 organizations | ❒ | $100 |
| Sustaining | ❒ | $100 * |

**BUSINESS**

| | | |
|---|---|---|
| Nonprofit Organization | ❒ | $45 |
| Contributing | ❒ | $250 * |
| Sustaining | ❒ | $500 * |
| Summit Circle | ❒ | $1000 * |

* Receive quarterly recognition in *Ecesis*

† **Cal-IPC** is the California Invasive Plant Council and **CNGA** is the California Native Grasslands Association

**The following members receive additional benefits:**

| Category | Copies of each *Ecesis* issue ** | No. of discounted rates at SERCAL events |
|---|---|---|
| Nonprofit Organization | 2 | 1 |
| Contributing Business | 3 | 3 |
| Sustaining Business | 4 | 4 |
| Summit Circle | 6 | 6 |

**When completing this membership form, you may designate specific individuals to be included on the mailing list.

NAME ________________________ DATE ________

COMPANY/AFFILIATION ________________________

ADDRESS ________________________

CITY ____________ ZIP ________ COUNTY ________

PHONE ____________ EMAIL ____________

❒ Check enclosed (please make payable to **SERCAL**)

❒ Please charge my credit card: __Visa __MasterCard

_ _ _ _ - _ _ _ _ _ - _ _ _ _ _ - _ _ _ _ _ Exp: _ _ / _ _

Billing address (if different than address above):

________________________

# Noteworthy Natural Resources Events

Do you know of an upcoming event that would be of interest to SERCAL members? Send specifics to julieDesign@cox.net

Jan 15: **Abstract submission deadline** for the California Native Grasslands Association's Annual Conference, "Conserving California's Grasslands: Policies & Practices" (Santa Rosa, May 1–3). **www.cnga.org/action/ conference.php**

Jan 22: **California Biodiversity Conference Meeting** on CA Wildlife Action Plan (Sacramento). **biodiversity.ca.gov/meetings.html**

Mid-February **Watch** for publication of **Call for Abstracts** for SERCAL's 15th Annual Conference, "Restoration's Bigger Picture, Linking Local Restoration to Regional and Global Issues" (Wells Fargo Center, Santa Rosa, August 13–16). **www.sercal.org**

Feb 18-22: EC08, International Erosion Control Association Annual Conference and Expo, "Environmental Connection" (Coronado Springs Resort, Orlando, FL). **www.icea.org.conference/annual/aboutec.asp**

Feb 29: **Bay-Friendly Landscaping & Gardening Conference**, (UC Berkeley Martin Luther King, Jr. Student Union). **www.BayFriendly.org**

Mar 5–8: **26th Annual Salmonid Restoration Conference**, "Central Valley Salmon & Steelhead: Restoration in the California Heartland" (Lodi). **www.calsalmon.org** or call 707.923.7501

Mar 12: **California Invasive Weeds Day** at the Capitol (Sacramento). **www.cal-ipc.org/policy/state/ciwad.php**

Mar 11–14: **Western Society of Weed Science Annual Conference** with special Arundo & Phragmites Symposium (Anaheim) **www.wsweedscience.org**

May 1: **Abstract submittal deadline** for SERCAL's 15th Annual Conference (Santa Rosa, August 13–16). **www.sercal.org**

May 6–9: **11th National Mitigation & Ecosystem Banking Conference** (Hyatt Regency, Jacksonville, FL). **www.mitigationbankingconference.com**

May 7–9: **Lower Colorado River Riparian Restoration Workshop**, (Las Vegas Springs Preserve, Las Vegas, NV; hosted by Southern Nevada Water Authority & Las Vegas Wash Coordination Committee) **www.lvwash.org**

SERCAL
California Society for Ecological Restoration
www.sercal.org
2701 20th Street, Bakersfield CA 93301-3334
Return Service Requested