

California Native Plant Society

Restoring San Diego: Practical Tips for Volunteer Restoration Projects

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#1. Multiplying Mulefat

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Seasonally dry streams in San Diego are often lined with mulefat (*Baccharis salicifolia*), an aromatic member of the Sunflower family that withstands floodwaters and other disturbance. As its Latin name implies, mulefat looks a lot like willow but can grow in drier areas. Like willow, its roots help stabilize stream banks. A mulefat-lined stream is a delightful place of sweet-smelling filtered sunlight. Propagating mulefat is an easy way to jump-start riparian restoration.

To add mulefat to a stream restoration project:

- Choose the right time of year – after the winter rains have moistened the soil.
- Use several mature shrubs close to the restoration site – this helps provide both plants adapted to site conditions and some genetic variation.
- Cut a stem of mulefat at least as long as your arm and as wide as your finger – the stem contains the sugars needed for growth. Thicker stems (> 1” diameter can be a bit shorter). A few cuttings from a single shrub will not harm it.
- Cut the bottom of the stem at an angle, so you remember which part to put in the ground.
- Strip off all of the leaves – this keeps the stem from drying out and dying. At this point, you may place the stems in a bucket of water and wait a week or two before planting.
- Take the stem to the planting site and push the cut end into the moist soil, as far as possible, but leaving at least two buds above the soil surface.
- Wait. New leaves with sprout in about two months. You should have robust plants growing in your canyon in no time!

Photo guides and more information about mulefat:

www.sdnhm.org/fieldguide/plants/bacc-sal.html

www.calflora.net/bloomingplants/mulefat.html (shows male and female flowers)

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#2. Using stem cuttings to make container plants

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Volunteer restoration groups on a budget appreciate being able to grow their own container plants. Did you know that there is also a good biological principle behind propagation from cuttings? San Diego is home to a wide variety of plant communities with varying environmental conditions. The resident plant populations have adapted to the particular sites over years of natural selection. Plants from your particular area may be more suited to it than plants of the same species from miles away.

Cuttings are an easy way to propagate plants for many species, especially those with difficult-to-germinate seeds. The process is low in labor and can be successful in the corner of a residential back yard. Keeping notes on which species work for you will help other people.

To grow plants from cuttings:

- Prepare common 1-gallon or 5-gallon size pots by filling with soil and soaking thoroughly. If soil is hard to wet, place the pot in a bowl of water overnight, then let drain.
- Get permission from the property owner before taking samples. Removal of a small number of stems will not hurt a plant.
- Cut a stem about one to two feet long.
- Remove all the leaves, which will otherwise desiccate the cutting
- Push the cut end into the soil all the way to the bottom, leaving two nodes above the soil.
- Place the pots in filtered sunlight (for example, under a tree or a shade cloth)
- Sprinkle the pots every three days or so.
- By the end of a month, the cutting will be sprouting new leaves, or it will be clearly dead. If dead, toss it and reuse the pot for a new cutting.
- Once the plant has a number of new leaves and is growing well, plant it in your restoration site.

Species that are fairly easy to propagate from cuttings:

Sambucus mexicana

Epilobium sp.

Salix sp.

Baccharis salicifolia

Pluchea serricea

Populus fremontii

Populus basalmifera ssp. *trichocarpa*

Artemisia douglasiana

Blue Elderberry

California fuchsia

Willow

Mulefat

Arrow weed

Western Cottonwood

Black Cottonwood

Mugwort

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#3. Using container plants in a restoration project

Some sites may benefit from introduction of container plants. For instance, the native seed bank might be diminished because extensive grading. Or you might want to get more coverage more quickly than possible by seeding. In weedy areas, using container plants properly will result in a much higher chance for plant establishment than spreading seed alone, which is frequently ineffective due to the weeds and our unpredictable rains.

Appropriate container plants are grown from seed either collected in the wild or propagated from wild-collected seed. Don't use "horticultural varieties" of plants (e.g. *Ceanothus* "Dark Star"), even if they are derived from local species. The reason: horticultural varieties are typically selected from a single or small number of individuals, for a particular characteristic which suits a landscaping requirement. This greatly reduces the genetic variability that wild plants need to survive without care in a natural environment. If used in large quantities, the genes from horticultural varieties may even reduce the fitness of wild populations.

How to use container plants

- Assess your site: is it riparian or upland? Coastal sage scrub or chaparral? With coastal influence or inland? You can figure out what *should* be growing on the site by visiting other natural lands in your area, or by consulting the California Native Plant Society for advice.
- Use container plants grown from seeds collected as close as possible to the restoration site. Don't use horticultural selections.
- Obtain the container plants. You can grow your own, or order from commercial sources (see www.cnpsd.org/horticulture for a list of native plant nurseries).
- Identify water source: even if they are low-water-use plants, container plants *must* be watered when they are planted and several times afterwards. If houses are close by, homeowners may be willing to donate water from a hose tap, especially after you explain the purpose of the project. Other possibilities are carrying the water in using 1-gallon jugs, or from containers transported to the site in a truck or all-terrain vehicle.
- Prepare the hole: use a 'duckbill' shovel or pickax to dig the hole, and arrange the excavated soil into a circular "levee". The goal is to put the plant in the middle of a depression that will retain water. The proper technique is difficult to describe, so you may want to visit a project where you can learn the details.
- Water the hole: fill the hole with water and let it soak in. Do this again as many times as you can. You are creating a "water account" for the plant that will help it to grow deep roots.
- Remove the plant from the container as gently as possible. Contrary to advice for typical landscape plants, don't rip into the root ball of natives; many will not appreciate it.
- Place the plant in the hole; add back soil to the original level of the soil in the container. Tamp the soil around the plant with your hand or foot to eliminate air

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- spaces around the roots. Pour more water on top to further settle the soil around the root ball.
- Rock mulch
 - Water some more, until you run out of time or water Then do a rain dance – a good soaking rain will save you lots of labor. In its absence, you need to return to the site in 2-3 weeks and water the plants again; at this point, you will appreciate having well-designed basins around the plants. If you plant in the rainy season (November – February) and get a couple of good soaking rains, you won't have to water through the summer. If you plant outside of this season, watering through the summer will be necessary to help your plants survive.

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#4 Using prickly-pear and cholla cactus in restoration

Lazy restorationists, listen up! This is the easiest restoration practice possible, once you learn to spread cholla without injury. It's not so much the spines you need to look out for, but the "glochids" -- the tiny deciduous spines that form a ring at the base of the longer spines. Although cacti can be painful, they have excellent wildlife value: coast prickly pear (*Opuntia littoralis*) is the nesting habitat for cactus wren, now uncommon in urban San Diego.

These techniques work for both the pads of prickly pears (*Opuntia* spp.) and or stems of chollas (*Cylindropuntia* spp.). Coast prickly pear and coast cholla (*C. prolifera*) are the most common coastal cacti; for the complete list of our cacti, see <http://www.sdnhm.org/research/botany/sdplants/cactaceae.html#Cactaceae>.

Avoid propagating Indian fig (*Opuntia ficus-indica*). Although common in San Diego canyons, it is an escaped ornamental that hybridizes with natives. This opuntia grows upright, is gray-green, and usually lacks spines, which are less than an inch long if present. Don't plant it, eat it: <http://nopales.us/recipes.htm>.

These techniques work for both the pads of prickly pears (*Opuntia* spp.) and or stems of chollas (*Cylindropuntia* spp.):

- Choose the right place: cactus like lots of sun. They may grow in the shade of other plants, but only on south-facing slopes. Avoid wet spots or deep shade or they will rot.
- Choose the right source: mature plants from a nearby area are best. Never dig up cactus unless the bulldozers are rolling; instead simply remove a few pads or stems from a large plant.
- Protect your hands: Use a "trash-picker" (hand-operated tongs) to grasp the pad or cholla stem, and place them in a paper sack. Thick gloves will work too, but look where you grab – and where you step.
- Wait a bit: Store the pads/stems in a dry place for anywhere from a couple weeks to several months. This gives the base of the pad time to 'harden off' to resist infection.
- Plant the pad: The pads/stems will root once they are in contact with the soil. You can simply scatter the pads on the ground, or bury the lower quarter or so to improve contact. Stake them or place them under an open shrub like sagebrush to avoid stepping on it.

That's it! The cactus will patiently wait until a rain stimulates it to set roots down into the damp soil.

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#5 What are the right plants for habitat restoration in my area?

Plant communities are groups of plant species that grow together in an area. Much like the businesses in a human community, they play a big role in determining what insects, birds, and animals can make a living in an area. Friends Groups often restore habitat and develop habitat for threatened animals or plants.

Habitat restoration and development use appropriate container plants or seeds to establish a native plant community. Because plants have different characteristics that are important for their relationships in the area, we need to pay careful attention to the selection of plants used in habitat restoration in order to maximize the value of the restoration. Although both have pretty yellow flowers, using brittlebush (a desert species) on the coast, instead of California sunflower (a coastal species) will likely not result in a habitat with higher ecological value. Keep in mind that if the soil was not badly disturbed, your area might have an abundant seed bank. In this case, you won't need to bother with container plants, just keep the weeds under control.

San Diego has a highly diverse flora. The appropriate native plant choices for an area can be difficult for nonprofessionals to determine without a lot of work. Luckily, the Plant Atlas database at the San Diego Natural History Museum can help you get started. Learn where the plants like to grow (based on soil, elevation, distance from the coast, slope aspect - facing north, south, east, or west), and you can create **a plant list**. Take your list and visit nearby high-quality native plant communities to learn which plants are dominant and use more of those in the plan. Look to see which plants tend to grow next to each other in order to group them properly. Use this information to create **a planting plan** from your plant list. It's helpful to consult a professional restoration biologist to review lists and plans.

Sourcing the plant material from a responsible source is crucial. Problems arise when seed stocks are contaminated with weed seeds, spreading weeds to new areas. Another bad practice is to use container plants of related species that are not native to a particular area. This can result in increased rates of hybridization with unknown consequences for the desired species. Also, in some cases container plants and seed stocks can be mislabeled, so always check the plants and seeds against the labels.

To avoid these problems, the best source of plant material is from established native plants in adjacent areas. Seeds can be collected and distributed on the site or used to start container stock. Collect seeds properly, ethically (leave enough for the local plants and animals!) and legally (get permission to collect seeds from the land owner, and follow their guidelines). Alternatively, purchase container plants from reputable native plant nurseries that sell locally-collected stock and keep records to demonstrate the origin.

How to create a custom plant list for your area

- Navigate to <http://www.sdplantatlas.org/> hosted by the San Diego Natural History Museum.
- Click on menu Database Search > Search The Database

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- Click on “Atlas Grid Map”
- Find the Atlas Square number for your location
- Return to the Search The Database page
- Enter your Atlas Square number where indicated
- Click on Download as Excel or Download as Word. (Note, if you don’t have these programs, other related programs may open them.)
- Pay close attention to the column named “Native” – these species have been identified as plants native to San Diego County.
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For more about concepts and practices in ecological restoration

<http://www.ser.org/>

List of native plant nurseries in San Diego

<http://www.cnpsd.org/horticulture/nurseries.html>

How to collect seeds properly

http://www.cnps.org/cnps/grownative/propagation/seed_collect_clean.php