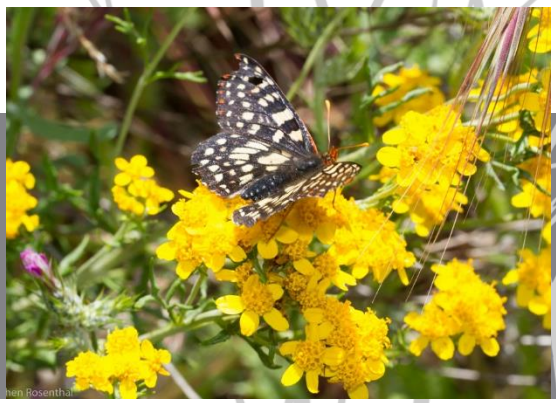
# Native Plants for School & Urban Gardens

*A Survival Guide*

California Native Plant Society



## Before You Get Started

*What you need to know before selecting and purchasing native plants or seeds*

## Habitat Gardens

*What is a native plant community/native plant habitat garden?*

## Plant Communities

*Architecture of common native plant communities or native plant habitats*

Written by **Betsey Landis**

*CNPS Los Angeles/Santa Monica Mountains Chapter*

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# A Survival Guide

*Dedicated to everyone who wants to plant native plants in a school or urban garden and survive the experience.*

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# What You Need to Know Before Selecting and Purchasing Native Plants or Seeds

1. **Is the planting area near a stucco wall, a wooden or concrete block fence, a concrete sidewalk, a paved driveway, a place where the roof gutters drain, large trees with big root systems, tall hedges, surrounded by grass, etc.? Is the planting area flat or on a slope?**
    - Concrete and stucco leach lime and calcium salts into the soil. Plants in those areas should like limestone-based soils.
    - Unpainted wooden fences are similar to trees in woodlands or chaparral, as are large trees with big root systems, so try plants from those habitats.
    - Where roof gutters drain, a riparian (streamside) area may be created using french drains, swales (shallow channels) lined with cobbles or gravel to increase water percolation. Try native plants requiring more moisture in those areas.
    - Tall hedges—think chaparral, especially north-facing chaparral.
    - Chaparral and coastal sage scrub plants generally do better on slopes than on flat areas. Think meadows or savannas for flat areas.
2. **Is the planting area in full sun during the day, or is it in shade part of the day, or is it in full shade all day long? If the planting area is on a slope, which way does the slope face-- north, south, east or west?**
    - Most nurseries specify how much sun or shade native plants require. It's a good exercise to draw the patterns of sun and shade in the morning, at noon, and in the late afternoon.
    - If planting on a slope, north-facing and east-facing are cooler than south-facing or west-facing slopes.
3. **What kind of soil is in the area to be planted? Is it sandy, silty or full of clay or rocks? Different kinds of soil may be present in different areas of developed sites, especially if the site was bulldozed, or is an old site where the landscaping has been changed or amended repeatedly through the years.**
    - School grounds often have compacted soil, which can be corrected by planting 1- gallon size chaparral shrubs, covering the site with three to five inches of shredded bark mulch or other chipped mulch (not compost and no fertilizers). Cast annual native plant seeds over the mulch and let the native plant roots start working the soil. All planting holes and the mulch must be thoroughly soaked before planting shrubs or casting seeds.
    - Match the native plants to the types of soil. Some native plants are fairly tolerant of soil ranging from slow-draining clay to fast-draining sandy soil, but that may be linked to growing on slopes or ridges. Others require rocky soil or gravel or alkaline or acidic soils. If the site has been fertilized for decades it may have high levels of nitrogen, potassium, phosphorus or heavy metals from the sewage sludge that is routinely added to fertilizers here. Problem soils may need to be tested in a licensed soil lab. A soil test should include a full soil profile, soil texture and pH.

# What You Need to Know Before Selecting and Purchasing Native Plants or Seeds

4. **What kind of drainage does the planting area have? Take a shovel and dig a hole about a foot deep and fill it with water.**
   - If the water drains out through the bottom and sides of the hole in a minute or two it drains too fast.
   - If the water drains out more slowly, taking about ten to fifteen minutes to drain out through the sides and bottom of the hole the drainage is perfect for most plants.
   - If the water is still in the hole after an hour it is very slow draining. Watering the plants must be done carefully and not often so the plant roots do not rot.
   - There are native plants for every situation. Irrigation must be tailored to the drainage characteristics of the soil. For instance, drip irrigation does not work in clay or other very slow-draining soils.
5. **What kind of irrigation is there? A hose or watering can or overhead sprays work best for native plants.**
   - Native plants need winter water more than summer water.
   - Native plants usually do not need water after they are established unless there is not enough winter rain or there is a long, extremely hot spell in the summer.
6. **Plan to keep tall trees and shrubs away from buildings and walls. Do not plant deeprooted plants near any walls or fences.**
   - Always find out how tall and what size canopy trees and shrubs have. (Canopy means how far the leafy top cover extends horizontally.) Drawing circles representing the diameter of the mature canopies of trees and shrubs on the garden plan tells the designer very quickly whether the plant will fit the site or interfere with buildings, powerlines, or other plants.
   - Drawing such circles for wide-spreading, low-growing plants is also necessary to prevent overly dense plantings which may take over the site, choking other plants on the site and covering adjacent sidewalks.
   - Always draw a plan of the garden to scale, on paper with a grid, so everyone involved with the project understands where all the plants will go, where the water supply or irrigation is, and where any other elements, like paths, benches, tables, or kiosks can be placed without interfering with growing plants.
7. **Is a water-conserving or a drought-tolerant garden being planned?**
   - Water-conserving gardens require two things: a way of keeping the water used onsite and a healthy set of plants. Control the drainage from the site to the best of your ability through the use of dry creek beds, infiltration pits, french drains and temporary ponding areas.

- Select plants that develop deep root structures and give them the room and deep irrigation needed to develop healthy root growth. Those roots will sustain their plants on less water than plants with shallow roots or plants that are too crowded to develop strong root systems.
- Drought-tolerant gardens need plants that are adapted to very dry habitats or have developed lifestyles to deal with droughts. Dry habitats are some shrub habitats such as sage scrub, some chaparral habitats, desert habitats and some dry mountain habitats. That does not include riparian, wetland or many forest habitats. Choose native plants from the habitats that match the water regimen in the garden or the long-term availability of water.
- Lifestyles to survive drought may be: ways of conserving water within the plant's roots and shoots, going summer-deciduous (dormant) until winter rains arrive, having thick tough leaves or other leaf structures that prevent evaporation, growing shorter to conserve nutrients, or developing a seedbank and disappearing completely until the rains come again.

NOTE: Deciduous means the plant drops all its leaves in a short time, but the plant is still alive and will produce new leafy growth when the seasons change.

### 8. School districts and private schools may have restrictions on the location of plants on the campus.

- For example, bushy plants flowering during the school year are generally not allowed near outdoor eating areas or outdoor playgrounds because the flowers attract numerous honey bees.

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# What is a Native Plant Community or Native Plant Habitat Garden?

*Native plant community/habitat structures from B. Landis, Southern California Native Plants for School Gardens, CNPS.*

## Native Plant Communities / Native Plant Habitats

In the following descriptions of the architecture of native plant communities / native plant habitats, native plants generally are not named by genus or species. Instead native plants are divided into groups: trees, shrubs, perennials, annuals, bulbs, ferns, grasses and vines. Definitions of terms precedes the habitat descriptions. Native plant community / habitat architecture is divided into tree layers, shrub layers, and herb layers as a simple way to define different types of plant communities. This definition by layers of height gives the garden designer a way of deciding which types of plants will do best in the garden site, e.g. if there is not much space, do not decide to buy plants that will grow to be tall trees with large canopies. Select small shrubs and herbs more suitable to the site.

The architecture of a native plant community/habitat that fits all the parameters of the chosen site tells the planners the basic structure for their garden. Knowing the types (trees, shrubs, herbs) of native plants living in various native plant communities/habitats that fit the garden site gives the planners key words (chaparral, woodland, sage scrub) to look for when visiting native plant nurseries, native plant sales or native plant websites. The native plants offered for sale usually have labels designating their habitat preferences. Draw a plan recognizing which plants will shade others and which will need sun or more water.

## Site Conditions

Before choosing the plant species, planners need to know the climate, sun, shade, water availability, soil type, drainage characteristics of the soil, elevation and topography of the site. Always ask if plants being purchased fit the list of garden site parameters. If seeds are being purchased be sure to ask if any of the seeds need special treatment before planting. Draw a plan with circles showing the mature size of all the plants.

NOTE: The characteristics of the proposed garden site where the native plants are going to live are what determines which native plant habitat or habitats should be selected, not a wish list of people wanting to duplicate every native plant community in their region. (See definition of habitat in Definitions).

Planners should consider in their design any structures and mature plantings on the site that will affect the possible choices of plant communities and the growth and health of the plants. The planners may decide the plants can best benefit the school as a way to correct bad drainage areas, to replace compacted lawns or old dying plant areas, to heal eroded areas. Done correctly, the native plant community garden or a well-planned garden of native plants will provide educational and gardening opportunities for students, teachers, parents and volunteers for years. The school calendar should include an annual school garden day for the whole school community, perhaps a “Harvest Day”, to harvest, prune, clean and mulch all the school gardens as a way to perpetuate the gardening ethic through the years.

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# Architecture of Common Native Plant Communities / Native Plant Habitats

**Chaparral:** Habitat with one or two species of trees at the most, a dominant shrub layer containing tall shrubs or small trees (10 – 20 feet in height), and a rich understory of annuals, ferns, perennials, a few grasses, vines, and bulbs. Chaparral habitat as defined here is open canopy hard chaparral. North-facing chaparral and east-facing chaparral generally are cooler, more moist and may have trees, while west-facing and southfacing chaparral generally are hotter and drier, with no trees.

**Coastal Sage Scrub (CSS):** Habitat with no tree layer, a dominant shrub layer usually less than six feet in height, and an herb layer that may contain grasses, annuals, ferns, herbaceous perennials and bulbs. Creosote Bush: Desert wash habitat dominated by a shrub layer of Creosote Bush with other shrubs and small trees. Herb layers dominate with annuals and short-lived perennials in season (after rains). No tree layer.

**Forest:** Habitat with 75% to 100% tree canopy, a dominant tree layer. The shrub layer has a few shade-loving shrubs with ferns and shade-loving bulbs and annuals. Vines grow high in this habitat, seeking sunlight.

**Grass, Grassland:** Habitat with no trees, a sparse to non-existent shrub layer and a rich herb layer dominated by grasses and annuals, with herbaceous perennials and bulbs.

**Joshua Tree Woodland:** Desert woodland dominated visually by Joshua Trees. This habitat is dominated spatially by desert shrubs and cacti in the shrub layer and an herb layer with grasses, annuals and perennials (in season).

**Montane or Montane Woodland:** Woodland habitat at higher elevations, which is usually dominated by pines, with other tree species, a sparse shrub understory, a few grasses, perennials and annuals.

**Pinyon-Juniper Woodland (P-J):** Desert or desert montane woodland dominated by pinyon and juniper trees and mid-sized shrubs, with a few grasses and desert annuals.

**Riparian:** Habitat along seasonally-flowing or year-round streams, springs or seeps. The habitat has trees that are often deciduous (drop their leaves in a short time), an abundant shrub layer with vines and an herb layer containing herbaceous perennials, annuals, ferns and grasses.

**Savanna:** Habitat with less than 10% tree canopy, few shrubs and a dominant herb layer. Tree layer may be 80 to 100 feet tall with equally broad canopies. Grass dominates the herb layer, though there are bulbs and annuals as well.

**Scrub or Sage Scrub:** Desert or dry inland habitats having the same architecture as Coastal Sage Scrub.

**Strand:** Habitat having no tree layer, a shrub layer usually less than four feet in height and an herb layer that is either very low or about the same height as the shrub layer. This habitat is sand: coastal or desert dunes.

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# Definitions and References

**Annual:** A plant that finishes its life cycle (e.g. germinating, growing, flowering, fruiting, dispersing seeds, dying) in one growing season.*

**Biennial:** A plant generally taking two years to complete its life cycle, flowering and fruiting in its second year.*

**Community:** All the organisms inhabiting a common environment and interacting with one another.*

**Habitat:** The environment of an organism, where it is usually found.*

**Herb:** A non-woody seed plant with a relatively short-lived aboveground portion.*

**Herb layer:** In the architecture of a plant community, the herb layer is the lowest layer above ground level.

**Perennial:** A plant in which the vegetative structures (e.g. roots, shoots/stems, leaves, flowers, fruits) live year after year.*

**Shrub:** A perennial woody plant smaller in height than trees and having several woody stems arising at or near ground level.*

**Shrub layer:** In the architecture of a plant community, the shrub layer is the middle layer between the herb layer and the tree layer. The height of the shrub layer may range from 1 foot to 20 feet in height.

**Tree:** A perennial woody plant usually with a single woody stem (trunk) and a mature height taller than 20 feet. Small trees are under 20 feet in height and are considered here as shrubs. The height of 20 feet is an informal designation arising from nursery descriptions of large and small trees.

**Tree layer:** In the architecture of a plant community, the tree layer is the tallest layer, forming a canopy over the shrub and herb layers. Not all plant communities have all three layers.

* - Based on definitions in Raven, Peter H., R.F. Everts, S.E. Eichhorn, Biology of Plants, 5th edition, 1992. Worth Publishers, 33 Irving Place, N.Y., N.Y. 10003

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