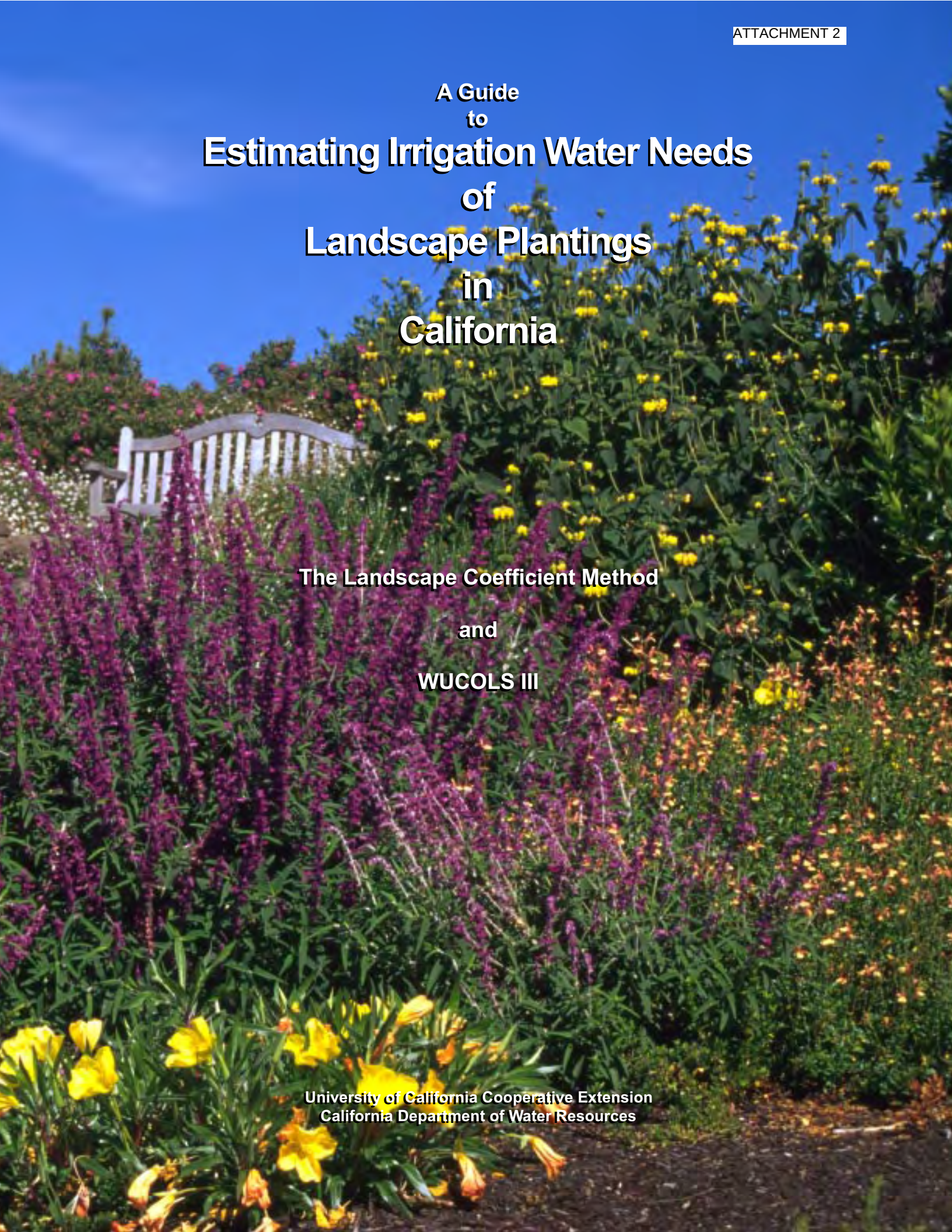
ATTACHMENT 2



A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California

The Landscape Coefficient Method

and

WUCOLS III

University of California Cooperative Extension
California Department of Water Resources

Cover photo: The Garden at Heather Farms, Walnut Creek, CA

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A Guide
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Estimating Irrigation Water Needs of Landscape Plantings in California

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WUCOLS III*

*WUCOLS is the acronym for Water Use Classifications of Landscape Species.

University of California Cooperative Extension
California Department of Water Resources

August 2000

Preface

This Guide consists of two parts, each formerly a separate publication:

Part 1—*Estimating the Irrigation Water Needs of Landscape Plantings in California: The Landscape Coefficient Method*

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Part 2—*WUCOLS III* (Water Use Classification of Landscape Species)

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- K.S. Jones, University of California Cooperative Extension

Part 1 describes a method for calculating landscape water needs, while Part 2 gives evaluations of water needs for individual species. Used together, they provide the information needed to estimate irrigation water needs of landscape plantings.

Part 1 is a revision of ***Estimating Water Requirements of Landscape Plants: The Landscape Coefficient Method***, 1991 (University of California ANR Leaflet No. 21493). Information presented in the original publication has been updated and expanded.

Part 2 represents the work of many individuals and was initiated and supported by the California Department of Water Resources. This third revision (WUCOLS III) includes many species not previously evaluated, as well as an update and reorganization of support information.

These two publications are companion documents and are intended to be used together.

Eschscholzia california, California poppy

First-time readers are encouraged to carefully review both parts of this Guide before making estimates of landscape water needs.

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Part 1

The Landscape Coefficient Method

The Landscape Coefficient Method (LCM) describes a method of estimating irrigation needs of landscape plantings in California. It is intended as a guide for landscape professionals. It includes information that is based on research **and** on field experience (observation). Readers are advised that LCM calculations give **estimates** of water needs, not exact values, and adjustments to irrigation amounts may be needed in the field.

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Introduction

Part 1 leads you through the concepts, terms, and formulas needed to estimate irrigation water needs. You will learn:

- the key formulas needed for calculations,
- the principal concepts that serve as a basis for calculations,
- how to use the methods in the field,
- how to use estimates in irrigation planning and management,
- where to find important numbers in reference tables, and
- considerations for special landscape situations.

Chapters

After providing background information on estimating water needs for agricultural crops and turf in Chapter 1, landscape needs are addressed in Chapter 2. The **landscape coefficient**, a key factor in the formula for estimating landscape water requirements, is introduced in Chapter 2. Subsequent chapters give examples of how to calculate and use the landscape coefficient. Chapter 5 addresses irrigation efficiency and gives examples of how it is used to determine total water needs. As a way of "putting it all together," a worksheet which summarizes the process is provided in Chapter 6. Special topics are discussed in Chapters 7 and 8. The appendices provide further information.

Audience

All landscape professionals involved in the planning, installation, and maintenance of irrigated landscapes should find this information of value. This includes architects, planners, contractors, park managers, gardeners, consultants, water suppliers, auditors, and students.

Importance

Estimates of landscape water needs are important for at least three reasons:

1. ***Water Conservation.*** Water is a limited natural resource. Efficient water use in urban landscapes contributes substantially to the conservation of this resource. Water use efficiency can be achieved by supplying only the amount of water sufficient to meet plant needs.

Applying only the amount of water landscape plants need to remain healthy and attractive is an efficient use of a natural resource.

2. ***Economics.*** Water costs continue to increase. By applying only that amount of water needed by landscapes, and avoiding excess use, money can be saved.

3. ***Landscape Quality.*** The potential for plant injury caused by water deficits or excess can be minimized by identifying and meeting plant needs.

Getting Started

First-time readers are encouraged to review the entire Guide prior to making water needs estimates. Field examples and a practice worksheet in Chapter 6 show how to use the information presented in previous chapters. Be sure to review the appendices; they contain important numbers for calculations.

Formulas and Numbers

Formulas and numbers are needed to calculate irrigation water requirements. Fortunately, the calculations needed here are simple and straightforward. They require only a basic understanding of mathematics. Once you have reviewed the examples and made some calculations on your own, you should have no difficulty. A worksheet with all the formulas and sample calculations is included in Chapter 6.

Chapter 1— Estimating Water Requirements for Crops and Turf

In agriculture, irrigation water requirements are well established for many crops. In urban landscapes, irrigation requirements have been determined for turfgrasses, but not for most landscape species. This chapter discusses the method used to estimate water requirements for agricultural crops and turfgrasses. Chapter 2 adapts this method for application to landscape plantings.

Water requirements for agricultural crops and turfgrasses have been established in laboratory and field studies by measuring plant water loss (evapotranspiration). The total amount of water lost during a specific period of time gives an estimate of the amount needed to be replaced by irrigation. Since growers and turf managers are not equipped to measure plant water loss in the field, a formula was developed which allows water loss to be calculated. This formula (referred to as the ET_c formula) is written as follows:

Water requirements of both cool and warm season turfgrasses have been established (see Table 1).

Water requirements of many agricultural crops have been established (see Table1).

$$ET_c = K_c \times ET_o$$

Crop Evapotranspiration =
Crop Coefficient x Reference Evapotranspiration

This formula states that water loss from a crop (crop evapotranspiration, ET_c) equals the amount of water that evaporates from a 4- to 7-inch tall cool season grass growing in an open-field condition (reference evapotranspiration, ET_o) multiplied by a factor determined for the crop (crop coefficient, K_c).

Reference evapotranspiration (ET_o) is estimated from a Class A evaporation pan or from a specialized weather station. Normal year (historical) average values for many locations in California are found in Appendix A. Current daily ET_o values are available from the California Irrigation Management Information System (CIMIS) and can be accessed via the Internet (**www.cimis.water.ca.gov**) or by contacting the California Department of Water Resources (see Appendix D).

A specialized weather station (CIMIS station) or a Class A evaporation pan (background) can be used to determine reference evapotranspiration (ET_o) for a site. Daily CIMIS data is available online at **www.cimis. water.ca.gov**.

The **crop coefficient (K_c)** is determined from field research. Water loss from a crop is measured over an extended period of time. Water loss and estimated reference evapotranspiration are used to calculate K_c as follows:

$$K_c = \frac{ET_c}{ET_o}$$

As seen in the above equation, the crop coefficient (K_c) is simply the fraction of water lost from the crop relative to reference evapotranspiration. Typically, crop water loss is less than reference evapotranspiration and, therefore, the crop coefficient is less than 1.0. For example, if water loss from corn was measured to be 4 inches in a month, and reference evapotranspiration for the same month was 8 inches, then the crop coefficient would be 0.5. Crop coefficients have been established for many crops and for turfgrasses. A sample of values is given in Table 1.

Table 1—
Crop Coefficients for Various Crops and Turfgrasses

K_c values for agricultural crops typically change during the seasons: low values are for early season (March/April) or late season (September/October) and high values for midseason (May/June/July).

K_c values		
	Low	High
Deciduous orchard*	0.50	0.97
Deciduous orchard with cover crop**	0.98	1.27
Grape	0.06	0.80
Olive	0.58	0.80
Pistachio	0.04	1.12
Citrus	0.65	year-round
Turfgrass		
Cool season species	0.8	year-round
Warm season species	0.6	year-round

Source: UC Leaflet Nos. 21427 and 21428 (see references)
* Deciduous orchard includes apples, cherries, and walnuts
** When an active cover crop is present, K_c may increase by 25 to 80%.

In summary, an estimate of crop evapotranspiration is made from reference evapotranspiration and crop coefficient values. Estimates can be made for any location where reference evapotranspiration data exists and for any crop (or turfgrass) that has a crop coefficient.

Example: A grape grower in Monterey County wants to estimate how much water the vineyard may lose in the month of July. Using the ET_c formula, two numbers are needed: reference evapotranspi-

ration (ET_o) for July in Monterey and the crop coefficient (K_c) for grapes. July ET_o for Monterey can be found in Appendix A, and the K_c for grapes is listed in Table 1 (above). With the two values, the following computation is made:

ET_o = 0.18 inches per day x 31 days = 5.58 inches (average for July in Monterey)
K_c = 0.8 (midseason value for grapes)

ET_c = Kc x ET_o
ET_c = 0.8 x 5.58 = 4.46 inches

The grower has estimated that 4.46 inches of water will be lost from the vineyard (via evapotranspiration) in the month of July. By using this ET_c estimate, the grower can calculate irrigation water requirements for the vineyard. (For an estimate of the total amount of water to apply, see Chapter 5).

The ET_c formula is the **key formula** for estimating water loss from crops and turfgrasses. A version of this formula will be used in Chapter 2 to estimate water loss for **landscape** plantings. It is recommended that you become familiar with the ET_c formula before continuing.

Chapter 2— Estimating Water Needs for Landscape Plantings

Two formulas are used to estimate water needs for landscape plantings:

- the landscape evapotranspiration formula and
- the landscape coefficient formula.

Both formulas are introduced here and then used in subsequent chapters to estimate water needs. The landscape coefficient was developed specifically for estimating **landscape** water needs and is the principal focus of Chapter 2.

The method used for estimating water needs for landscape plantings is basically the same as that used for crops and turfgrasses. The ET_c formula discussed in Chapter 1 is simply modified for application to landscapes. One key change, however, has been made: instead of using the crop coefficient (K_c), a landscape coefficient (K_L) has been substituted.

The Landscape Evapotranspiration Formula

Water needs of landscape plantings can be estimated using the landscape evapotranspiration formula:

$$ET_L = K_L \times ET_o$$

Landscape Evapotranspiration =
Landscape Coefficient x Reference Evapotranspiration

This formula (called the ET_L formula) states that water needs of a landscape planting (landscape evapotranspiration, ET_L) is calculated by multiplying the landscape coefficient (K_L) and the reference evapotranspiration (ET_o).

As mentioned above, the ET_L formula is basically the same as the ET_c formula from Chapter 1, except that a landscape coefficient (K_L) has been substituted for the crop coefficient (K_c). This change is necessary because of important differences which exist between crop or turfgrass systems and landscape plantings (see "Why a Landscape Coefficient").

The following is an example of a simple calculation using the landscape coefficient in the landscape evapotranspiration (ET_L) formula.

Example: A landscape architect wants to estimate water loss for the month of August from a large groundcover area being considered for a new commercial office park in Fresno. The architect looked up the reference evapotranspiration for August in Fresno (Appendix A) and found it to be 7.1 inches. The architect assigned a landscape coefficient value of 0.2. Using this information and the landscape evapotranspiration formula (ET_L formula), the architect makes the following calculations:

$K_L = 0.2$
$ET_o = 7.1$ inches for August in Fresno

$ET_L = K_L \times ET_o$
$ET_L = 0.2 \times 7.1 = 1.42$ inches

The architect estimates that the groundcover will need 1.4 inches in the month of August. (This is not the total amount of irrigation water needed, however, as irrigation efficiency needs to be considered. This topic is addressed in Chapter 5.)

In this example, a landscape coefficient was assigned. In actual practice, K_L needs to be calculated. The formula needed to calculate K_L is the heart of the landscape coefficient method and is the subject of the next discussion.

The Landscape Coefficient Formula

As the name implies, the landscape coefficient was derived specifically to estimate water loss from landscape plantings. It has the same function as the crop coefficient, but is not determined in the same way. Landscape coefficients are calculated from three factors: species, density, and microclimate. These factors are used in the landscape coefficient formula as follows:

$$K_L = k_s \times k_d \times k_{mc}$$

Landscape Coefficient =
species factor x density factor x microclimate factor

This formula (called the K_L formula) states that the landscape coefficient is the product of a species factor multiplied by a density factor and a microclimate factor. By assigning numeric values to each factor, a value for K_L can be determined. The landscape coefficient is then used in the ET_L formula, just as the crop coefficient is used in the ET_c formula.

Why a Landscape Coefficient?

Crop coefficients are used for agricultural crops and turfgrasses, so why not for landscape plantings? There are three key reasons why landscape coefficients are needed instead.

1. Unlike a crop or turfgrass, landscape plantings are typically composed of more than one **species**. Collections of species are commonly irrigated within a single irrigation zone, and the dif-

ET Rates and Plant Water Needs

Soil water availability plays a major role in controlling the rate of water loss from plants (ET rate). Many plants will lose water at a maximum rate as long as it is available. For example, some desert species have been found to maintain ET rates equivalent to temperate zone species when water is available. When soil moisture levels decrease, however, ET rates in desert species decline rapidly.

In landscape management, it is not the objective to supply all the water needed to maintain maximum ET rates. Rather, it is the intent to supply only a sufficient amount of water to maintain health, appearance and reasonable growth. Maximum ET rates are not required to do this.

The ET_L formula calculates the amount of water needed for health, appearance and growth, not the maximum amount that can be lost via evapotranspiration.

Some desert species, such as mesquite (*Prosopis glandulosa torreyana*), have been found to maintain ET rates equivalent to temperate zone species when water is available (Levitt et al 1995). When soil moisture levels decrease, however, ET rates in desert species decline rapidly.

Unlike agricultural crops or turfgrass, landscape plantings are typically composed of many species. Collections of species are commonly irrigated within a single irrigation zone, and the different species within the irrigation zone may have widely different water needs. Using a crop coefficient for one species may not be appropriate for the other species.

ferent species within the irrigation zone may have widely different water needs. For example, a zone may be composed of hydrangea, rhododendron, alder, juniper, oleander, and olive. These species are commonly regarded as having quite different water needs and the selection of a crop coefficient appropriate for one species may not be appropriate for the other species. Crop coefficients suitable for landscapes need to include some consideration of the mixtures of species which occur in many plantings.

2. Vegetation **density** varies considerably in landscapes. Some plantings have many times more leaf area than others. For example, a landscape with trees, shrubs, and groundcover plants closely grouped into a small area will have much more leaf area than one with only widely spaced shrubs in the same-sized area. More leaf area typically means an increase in evapotranspiration (water loss) for the planting. As a result, a dense planting would be expected to lose a greater amount of water than a sparse planting. To produce a reliable estimate of water loss, a coefficient for landscapes needs to account for such variation in vegetation density.

3. Many landscapes include a range of **microclimates**, from cool, shaded, protected areas to hot, sunny, windy areas. These variations in climate significantly affect plant water loss. Experiments in Seattle, Washington, found that a planting in a paved area can have 50% greater water loss than a planting of the same species in a park setting. Other studies in California found that plants in shaded areas lost 50% less water than plants of the same species in an open field condition. This variation in water loss caused by microclimate needs to be accounted for in a coefficient used for landscape plantings.

Collectively, these factors make landscape plantings quite different from agricultural crops and turfgrasses, and they need to be taken into account when making water loss estimates for landscapes. The landscape coefficient was developed specifically to account for these differences.

The Landscape Coefficient Factors: Species, Density, and Microclimate

Three factors are used to determine the landscape coefficient:

- Species
- Density
- Microclimate

These factors are key elements of the landscape coefficient method and need to be understood fully before K_L and ET_L calculations are made. As well as describing each factor, the following sections give information on how to assign values to each.

Species Factor (k_s)

The species factor (k_s) is used to account for differences in species' water needs. In established landscapes, certain species are known to require relatively large amounts of water to maintain health and appearance (e.g., cherry, birch, alder, hydrangea, rhododendron), while others are known to need very little water (e.g., olive, oleander, hopseed, juniper). This range in water needs is accounted for in the species factor.

Species factors range from 0.1 to 0.9 and are divided into four categories:

Very low	< 0.1
Low	0.1 - 0.3
Moderate	0.4 - 0.6
High	0.7 - 0.9

These species factor ranges apply regardless of vegetation type (tree, shrub, groundcover, vine, or herbaceous) and are based on water use studies for landscape species (Table 2) and applicable data from agricultural crops (Table 1).

An evaluation of plant water needs (based on field observations) has been completed for over 1,800 species. These values are presented in Part 2 (WUCOLS III). Species factor values can be found by looking up the species under consideration, and selecting an appropriate value from the category

Water: Needed for What?

In agricultural systems, water is applied to produce a crop. Whether it be tomatoes, beans, or apples, growers apply water to optimize yield and quality. In landscape systems, health, appearance, and growth are of greatest interest. Irrigation is managed to sustain plant defense systems, achieve desired canopy densities and color, generate desired growth, and produce flowers and fruit (in some species). Irrigation is not used to produce a harvestable crop in landscapes. Because of this difference between landscape and agricultural systems, landscapes typically can be managed at a level of irrigation lower than that needed for crop production.

range. The following is an example of using the WUCOLS list to select an appropriate k_s value.

Certain species, such as tree ferns (*Dicksonia antarctica* and *Cyathea cooperi*), require relatively large amounts of water to maintain health and appearance.

Example: A landscape manager in Pasadena is attempting to determine the water requirements of a large planting of Algerian ivy. In using the ET_L formula, the manager realizes a value for the species factor (k_s) is needed in order to calculate the landscape coefficient (K_L). Using the WUCOLS list (Part 2), the manager looks up Algerian ivy (*Hedera canariensis*) and finds it classified as "moderate" for the Pasadena area, which means that the value ranges from 0.4 to 0.6. Based on previous experience irrigating this species, a low range value of 0.4 for k_s is chosen and entered in the K_L formula. (If the manager had little or no experience with the species, a middle range value of 0.5 would be selected.)

Although the above example is straightforward, the assignment of species factors to plantings can be difficult. Refer to "Assigning Species Factors to Plantings" for guidance in making k_s assignments.

Some species, such as flannel bush (*Fremontodendron spp.),* need very little irrigation water to maintain health and appearance.

Table 2—
Irrigation Needs of Well-Established Landscape Species Determined from Field Research

Values are given as the minimum fraction of reference evapotranspiration needed to maintain acceptable appearance, health, and reasonable growth for the species. See Appendix D for complete references.

Plant Species	Fraction of ET_o
Potentilla tabernaemontani	0.5 - 0.75
Sedum acre	0.25
Cerastium tomentosum	0.25
Liquidambar styraciflua	0.20
Quercus ilex	0.20
Ficus microcarpa nitida	0.20
Hedera helix 'Neddlepoint'	0.20
Drosanthemum hispidum	0.20
Gazania hybrida	0.25-0.50
Vinca major	0.30
Baccharis pilularis	0.20

Reference: Staats and Klett; Hartin, et al; Pittenger, et al

Assigning Species Factors to Plantings

1. ***For single-species plantings***— When only one species occurs in the irrigation zone, use the k_s value assigned in the WUCOLS list. For example, coyote brush is assigned to the "low" category and has a k_s value from 0.1 to 0.3.

2. ***For multiple-species plantings***— **a.** When species have similar water needs: In well-planned hydrozones where species of similar water requirements are used, the selection of a k_s value is straightforward: simply select the category to which all species are assigned and choose the appropriate value. For example, if all the species are in the moderate category, then a value from 0.4 to 0.6 is selected.

b. When species water needs are not similar: In cases where species with different water needs are planted in the same irrigation zone, then the species in the highest water-need category determine the k_s value. This assignment is required if all plants are to be retained without water stress injury. For example, if species in low, moderate, and high categories are planted in the same irrigation zone, then to avoid water stress injury to species in the high category, a k_s value from 0.7 to 0.9 would need to be selected. Unfortunately, this means that species in the moderate and low categories will receive more water than needed, which may result in injury.

Considering that plantings with mixed water needs are not water-efficient in most cases and

Plant injury may occur when species with different water needs are planted in a single irrigation zone. During a drought, irrigation was withdrawn from this planting of star jasmine (*Trachelospermum jasminioides*) and cotoneaster (*Cotoneaster sp*). Subsequently, star jasmine was severely injured, while cotoneaster was not visibly affected.

the incidence of plant injury may increase, some management options are worth considering:

- If only a small number or percentage of plants are in the high category, then the replacement of such plants with species with lower water needs would allow for the selection of a k_s in a lower range.

- If all plants are to be retained, but a level of appearance somewhat less than optimal is acceptable, then a k_s value from a lower range may be selected. For example, in the case where plants in the low, moderate, and high categories are in the same irrigation zone, a k_s value from the moderate range may be selected with the understanding that some injury to species in the high category may result.

- In cases where all plants are to be retained and no water stress injury is acceptable, then supplemental irrigation for species in the high category should be considered. Again using the case where species in low, moderate, and high categories are planted in the same irrigation zone, a k_s value from the moderate range may be selected for the planting, provided additional water is supplied to individual plants with higher water needs. This approach requires an adjustment to the irrigation system whereby additional sprinklers or emitters are used to deliver supplemental water to species with higher water requirements.

Certain species, such as these coast live oak (*Quercus agrifolia),* can maintain health and appearance without irrigation (after they become established). Such species are grouped in the "very low" category and are assigned a species factor of less than 0.1. Many California native species are in this category.

3. ***For species in the "very low" category***—
It is important to remember that certain species can maintain health and appearance without irrigation after they become established. Such species are grouped in the "very low" category and are assigned a k_s of less than 0.1. Essentially this classification means that species in this group do not need to be irrigated unless winter rainfall is abnormally low. Accordingly, if no irrigation is supplied, then there is no need to calculate a landscape coefficient and a k_s value is not assigned. In low rainfall years, some irrigation may be needed, however, and a k_s value of 0.1 should be sufficient to maintain health and appearance in these species.

Density Factor (k_d)

The density factor is used in the landscape coefficient formula to account for differences in vegetation density among landscape plantings. Vegetation density is used here to refer to the collective leaf area of all plants in the landscape. Differences

in vegetation density, or leaf area, lead to differences in water loss.

The density factor ranges in value from 0.5 to 1.3. This range is separated into three categories:

Low	0.5 - 0.9
Average	1.0
High	1.1 - 1.3

Immature and sparsely planted landscapes typically have less leaf area than mature or densely planted landscapes, and thus lose less water. These plantings are assigned a k_d value in the low category. Plantings with mixtures of vegetation types (trees, shrubs, and groundcovers) typically have greater collective leaf areas than plantings with a single vegetation type, and thus will lose more water. These plantings are assigned a density factor value in the high category. Plantings which are full but are predominantly of one vegetation type, are assigned to the average category.

Example: The grounds manager of a college campus in San Diego wants to determine the landscape coefficient for a planting consisting of gazania groundcover and a few widely-spaced escallonia shrubs. Since the plants cover the ground surface completely, the planting is considered to be full. Based on these vegetation density characteristics (i.e., full and predominantly of one vegetation type), the manager determines that this is an average density planting and assigns a k_d value of 1.0.

Although this example might infer that the selection of the density factor is fairly simple, it can be difficult to determine. Vegetation density varies considerably and assigning density factors can be confusing. Many cases exist where plant spacing and distribution is not uniform and where a mixture of vegetation types exist.

Unfortunately, a standardized system of evaluating vegetation density for landscapes does not exist. Nonetheless, limited information from agricultural systems (principally orchards) can be applied to landscapes. The following sections describe two terms, canopy cover and vegetation tiers, which when applied to landscape plantings provide some guidance in assessing vegetation density.

Canopy Cover

Canopy cover is defined as the percentage of ground surface within a planting which is shaded by the plant canopy (or, simply, percent ground shading). A planting with full canopy cover will shade 100% of the ground surface, while a 50% canopy cover will cast a shadow on 50% of the ground area. The higher the canopy cover the greater the density of vegetation on a surface area basis.

Most mature landscape plantings have a complete canopy cover, i.e., the trees, shrubs, and groundcovers shade 100% of the ground surface. New plantings, immature plantings, and widely-spaced plantings are examples of cases where the canopy cover is less than 100%.

Orchard data gives an indication of how canopy cover affects water loss. Studies show that water loss from orchards does not increase as canopy cover increases from 70% to 100%. Below 70% cover, however, orchard water loss declines.

Applying this information to landscapes, plantings of trees with a canopy cover of 70% to 100% constitutes a complete canopy cover condition, and

would be considered as average for density factor assessments. A tree planting with less than 70% canopy cover would be in the low category.

For plantings of shrubs and groundcovers, a canopy cover of 90% to 100% constitutes complete cover. This represents an average condition for density factor assessments, while less than 90% cover would be in the low category.

Vegetation Tiers

Canopy cover gives an assessment of vegetation density on an area basis, i.e., the percent ground area covered by vegetation describes the closeness or sparseness of plants in a planting. Another dimension needs to be considered for landscapes: the vertical dimension. Landscapes are frequently composed of plants of various heights: tall trees, low groundcovers, and shrubs somewhere in between. Due to the typical growth form of each vegetation type, "tiers" of vegetation result.

When combinations of these vegetation types occur in a planting they add a height element which will have an affect on water loss. In orchard plantings, for example, field research has shown that the addition of a cover crop increases evapotranspiration from 25% to 80% above a bare soil condition. In other words, adding a groundcover-like planting beneath orchard trees results in a substantial increase in water loss.

In landscapes, groundcovers and/or shrubs planted in the understory of trees are likely to have a similar effect on water loss as found in orchard settings. Additionally, by adding trees to a groundcover planting or shrubs to a tree-groundcover planting, an increase in water loss would be expected.

In most cases, the presence of vegetation tiers in landscapes constitutes a high density condition. For example, a planting with two or three tiers and complete canopy cover would be considered to be in the high k_d category .

Landscapes are frequently composed of plants of various heights: trees, groundcovers, and shrubs. Due to the typical growth form of each vegetation type, "tiers" of vegetation result. Plantings with more than one tier are likely to lose more water than a planting with a single tier. Here, the trees and shrubs in the groundcover represent a higher water loss condition than if the groundcover occurred alone. The density factor accounts for differences in vegetation density.

Plantings with multiple tiers which do not have a complete canopy cover, however, may not constitute a high density condition. A new planting with trees, shrubs, and groundcovers, for example, has three vegetation tiers but canopy density is low. Although three tiers are present, this planting would be classified as low density.

Assigning Density Factor Values

Canopy cover and vegetation tiers are used to assess vegetation density for density factor assignments. Since it is very difficult to account for all the variation in vegetation density which occurs in landscapes, the following assignments are made simply as a guide to making reasonable assessments.

Average Density: k_d = 1.0

Plantings of one vegetation type: for trees, canopy cover of 70% to 100% constitutes an average condition. For shrubs or groundcovers, a canopy cover of 90% to 100% is considered to be an average condition.

This mixed planting of Wheeler's pittosporum (*Pittosporum tobira* 'Wheeler's Dwarf'), Indian hawthorne (*Rhaphiolepis indica*), American sweetgum (*Liquidambar styraciflua*), and coast redwood (*Sequoia sempervirens*) is considered to be average density (kd = 1.0). Trees are widely spaced through the sub-shrub/groundcover planting area.

Plantings of a single species, such as this iceplant groundcover (*Drosanthemum sp*), are considered to have average density (k_d = 1.0) when full (90 - 100% cover).

Plantings of more than one vegetation type: for mixed vegetation types, an average density condition occurs when one vegetation type is predominant while another type occurs occasionally in the planting, and canopy cover for the predominant vegetation type is within the average density specifications outlined above. For example, a mature groundcover planting (greater than 90% canopy cover) which contains trees and/or shrubs that are widely spaced would be considered to be average density. Additionally, a grove of trees (greater than 70% canopy cover) which contains shrubs and/or groundcover plants which are widely spaced would constitute an average condition.

Low Density: k_d = 0.5 - 0.9

Low density plantings are characterized largely by canopy covers less than those specified for the average density condition. For instance, a tree planting with less than 70% canopy cover would be assigned a k_d value less than 1.0. The precise value assigned (between 0.5 and 0.9) would be based on the canopy cover assessment: a lower k_d value for a thinner canopy cover.

For shrubs and groundcovers, canopy cover less than 90% constitutes a density less than average and a k_d value less than 1.0 would be assigned.

Plantings with mixed vegetation types generally have greater canopy covers than those of a single type. For instance, a groundcover planting with canopy cover of 50% constitutes a low density condition and a k_d of 0.7 might be assigned. If an occasional tree occurs in the planting, then the principal effect is one of increasing canopy cover, and an upward adjustment in k_d to 0.8 or 0.9 would be warranted.

High Density: k_d = 1.1 - 1.3

When canopy cover is full for any vegetation type, then increases in density result from increases in the number of plants of other vegetation types. For example, by adding trees to a mature groundcover planting (groundcover canopy cover = 100%), an increase in vegetation density occurs. The addition of shrubs to the planting further increases the density. This mix of vegetation types creates a layering or tiering of vegetation which represents potential increases in water loss. Upward adjustments of k_d can be made to account for vegetation tiering. The highest density condition, where all three vegetation types occur in substantial numbers in a planting, would be assigned a k_d of 1.3. In plantings where lesser degrees of vegetation tiering occurs (e.g., a two-tiered planting), then a k_d value of 1.1 or 1.2 is appropriate.

Microclimate Factor (k_{mc})

Microclimates exist in every landscape and need to be considered in estimates of plant water loss. Features typical of urban landscapes (such as buildings and paving) influence temperature, wind speed, light intensity and humidity. These features vary considerably among landscapes, resulting in differences in microclimate. To account for these differences, a microclimate factor (k_{mc}) is used.

The microclimate factor ranges from 0.5 to 1.4, and is divided into three categories:

Low	0.5 - 0.9
Average	1.0
High	1.1 - 1.4

The microclimate factor is relatively easy to set. An "average" microclimate condition is equivalent to reference evapotranspiration conditions, i.e.., an open-field setting without extraordinary winds or heat inputs atypical for the location. This microclimate is not substantially affected by nearby buildings, structures, pavements, slopes, or reflective surfaces. For example, plantings in a well-vegetated park which are not exposed to winds atypical of the area, would be assigned to the average microclimate category.

For shrubs and groundcovers, canopy cover less than 90% constitutes a density less than average (k_d < 1.0). This mixed planting would be assigned a low density value (0.5 - 0.9).

Plantings in a well-vegetated park, which are not exposed to winds atypical for the area, would be assigned to the average microclimate category (k_{mc} = 1.0). These conditions are similar to those used for reference evapotranspiration measurements (CIMIS stations).

"Low" microclimate conditions are as common as high microclimate conditions. Plantings that are shaded for a substantial part of the day or are protected from winds typical to the area would be assigned low values. These include the north side of buildings, courtyards, under building overhangs, and on the north side of slopes.

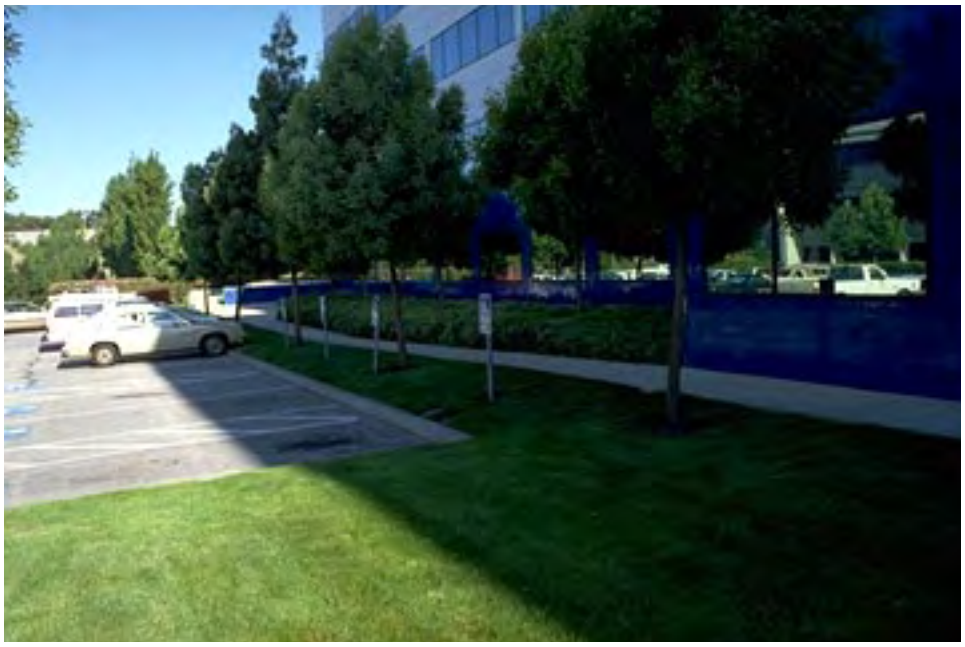
In a "high" microclimate condition, site features increase evaporative conditions. Plantings surrounded by heat-absorbing surfaces, reflective surfaces, or exposed to particularly windy conditions would be assigned high values. For example, plantings in street medians, parking lots, next to southwest-facing walls of a building, or in "wind tunnel" areas would be assigned to the high category.

The high and low microclimate categories have ranges of values. For example, the low category ranges from 0.5 to 0.9. The specific value assigned within a category will depend on an assessment of the degree to which the microclimate will affect plant water loss. For example, trees in a parking lot which are exposed to constant winds (atypical for the general area) will be assigned a higher value in the high category than if the location was not windy. Conversely, a courtyard planting in afternoon shade and protected from winds will be assigned a k_{mc} value in the low category, but less than that for a planting without afternoon shading.

Plantings surrounded by heat-absorbing surfaces, reflective surfaces, or exposed to particularly windy conditions would be assigned a high microclimate value (1.1 - 1.4).

Example: An irrigation consultant is estimating landscape water requirements for a large residential development. The buildings, parking lots,

walkways, and open areas at the site create substantially different microclimates within plantings. Starting with the open areas, he determines that conditions are quite similar to reference ET measurement sites and assigns them to the average category (k_{mc} = 1.0). Trees in the parking lot are exposed to heat from the asphalt pavement and reflected light from cars and are assigned to the high category. Since the parking lot is not exposed to extraordinary winds, however, he chooses a midrange value of 1.2. Shrub and groundcover plantings on the northeast side of buildings are shaded for most of the day and are assigned to the low category. Being protected from winds typical of the area as well, they are given a k_{mc} value of 0.6, in the lower end of the range.



Plantings that are shaded for a substantial part of the day, or are protected from winds typical to the area, are assigned low microclimate values (0.5 - 0.9). This planting on the northeast side of the office building is shaded for several hours each day.

Assigning Microclimate Factor Values

Average Microclimate: k_{mc} = 1.0

Site conditions equivalent to those used for reference ET measurements represent an average microclimate. Reference ET is measured in an open-field setting which is not exposed to extraordinary winds or heat inputs from nearby buildings, structures, or vehicles. Plantings in similar conditions would be considered to be in an average microclimate. Plantings in park settings are most typically assigned to this category. Although some hardscape may exist, vegetation dominates the landscape. Large plantings of groundcover, groves of trees, and mixtures of shrubs, turf, and trees in relatively open areas represent examples of an average microclimate condition. Small parks with adjacent buildings, extensive hardscapes, or exposed to extraordinary winds would not be included in the average category.

Low Microclimate: k_{mc} = 0.5 - 0.9

Sites which are shaded or protected from winds typical to the area are considered to be in the low microclimate category (Costello et al. 1996). Features of the site modify the microclimate such that evaporative conditions are less than those found in the average microclimate. Plantings located on the north side or northeast side of buildings, shaded by overhead structures, or within courtyard settings are typically assigned a k_{mc} value in the low range. Plantings protected from winds by buildings, structures, or other vegetation also would be assigned to the low category. The specific value assigned for the microclimate factor will depend on the specific site conditions. For example, a planting in a courtyard which is shaded most of the day and protected from winds may be assigned a value of 0.6, while a simi-

lar planting which is located on the northeast side of a building may be assigned a value of 0.8.

High Microclimate: k_{mc} = 1.1 - 1.4

Sites which are exposed to direct winds atypical for the area, heat inputs from nearby sources, and/or reflected light would be considered to be in the high microclimate category. These features of the site increase evaporative conditions above those found in an average microclimate condition. Plantings located in medians, parking lots, or adjacent to south or southwest facing walls which are exposed to higher canopy temperatures than those found in a well-vegetated setting would be in the high category. Plantings in wind tunnel locations and those receiving reflected light from nearby windows, cars, or other reflective surfaces are also in high microclimate conditions. The specific value assigned will depend on the specific conditions. For example, a shrub planting located next to a southwest facing wall may be assigned a k_{mc} value of 1.2, while a similar planting next to a southwest wall which is composed of reflective glass and is exposed to extraordinary winds may be assigned a value of 1.4.

Table 3—
Summary Table
Values for Landscape Coefficient Factors

	High	Moderate	Low	Very Low
Species Factor* (k_s)	0.7-0.9	0.4-0.6	0.1-0.3	<0.1
Density (k_d)	1.1-1.3	1.0	0.5-0.9	
Microclimate (k_{mc})	1.1-1.4	1.0	0.5-0.9	

* Species factor values may change during the year, particularly for deciduous species. See Table 1 for seasonal changes in crop coefficients for agricultural crops.

Chapter 3— Using the Landscape Coefficient Formula

The landscape coefficient formula was introduced in Chapter 2, and the three factors which determine its value were discussed. Now these factors are used to calculate values for the landscape coefficient. A series of field cases show the range of values that can be determined for K_L. In Chapter 4, calculations using the landscape coefficient in the ET_L formula are presented.

Using the information presented in Chapter 2, values for the landscape coefficient can be calculated. The following cases show how the landscape coefficient is used for a variety of species, density, and microclimate conditions. Species factor values will be taken from the WUCOLS list, while density and microclimate values are based on the planting and site conditions described. For quick reference, the following table gives values for each factor.

Landscape Coefficient Factors

	Species	Density	Microclimate
High	0.7 - 0.9	1.1 - 1.3	1.1 - 1.4
Mod./Ave.	0.4 - 0.6	1.0	1.0
Low	0.1 - 0.3	0.5 - 0.9	0.5 - 0.9
Very Low	< 0.1		

Case 1—A large, mature planting of star jasmine in a park in San Jose. It is in full sun and has little wind exposure.

$$k_s = 0.5$$
$$k_d = 1.0$$
$$k_{mc} = 1.0$$
$$K_L = 0.5 \times 1.0 \times 1.0 = 0.5$$

Analysis: Star jasmine is classified as moderate in the WUCOLS list (moderate range = 0.4 to 0.6) and a midrange k_s value of 0.5 is assigned. Since the planting is mature it will be considered full (i.e., canopy cover = 100%), and being of one vegetation type, it is classified as an average density and k_d is 1.0. The microclimate is similar to reference evapotranspiration conditions (full sun, open area, no extraordinary winds) and, therefore, is classified as average and k_{mc} is 1.0.

Case 2—A mixed planting of dwarf coyote brush, Pfitzer juniper, oleander, purple hopseed, and olive in an office park in Los Angeles. The planting is full, exposed to sun all day, but not to extraordinary winds.

$$k_s = 0.2$$
$$k_d = 1.2$$
$$k_{mc} = 1.0$$
$$K_L = 0.2 \times 1.2 \times 1.0 = 0.24$$

Analysis: All species are classified as low in the WUCOLS list and are assigned a midrange value of 0.2. Canopy cover is 100%, and since all three vegetation types occur, this is classified as a high density planting and a k_d value of 1.2 is assigned. The microclimate is average and a value of 1.0 is assigned.

Case 3—A mature planting of rockrose, star jasmine, and dichondra in an amusement park in Sacramento. The planting is in full sun and atypical winds are infrequent.

$$k_s = 0.8$$
$$k_d = 1.0$$
$$k_{mc} = 1.0$$
$$K_L = 0.8 \times 1.0 \times 1.0 = 0.8$$

Analysis: Species in this planting are in three different WUCOLS categories: low (rockrose), mod-

erate (star jasmine), and high (dichondra). To maintain the dichondra in good condition, a k_s value of 0.8 is needed. This means, however, that both the rockrose and star jasmine will receive more water than they need. Obviously this is not a water-efficient planting. Both the density and microclimate conditions are average and were assigned values of 1.0.

Case 4—A widely-spaced planting of camellia on a university campus in San Francisco. Canopy cover of the planting is 40% to 50%. A 4-inch mulch covers the ground throughout the planting. It is in full sun and no extraordinary winds occur.

$$k_s = 0.5$$
$$k_d = 0.5$$
$$k_{mc} = 1.0$$
$$K_L = 0.5 \times 0.5 \times 1.0 = 0.25$$

Analysis: Camellia is classified as moderate in the WUCOLS list and is assigned a midrange value of 0.5. This is a low density planting of a single species and a k_d value of 0.5 is assigned. The microclimate is average and given a value of 1.0.

Case 5—A planting of leatherleaf mahonia and Burford holly in an office park in Pasadena. The planting is full, but shaded in the afternoon by an adjacent building. The building also blocks afternoon winds typical for the area.

$$k_s = 0.5$$
$$k_d = 1.0$$
$$k_{mc} = 0.6$$
$$K_L = 0.5 \times 1.0 \times 0.6 = 0.30$$

Analysis: Both species are classified as moderate in the WUCOLS list and are assigned a midrange value of 0.5. The canopy cover is full and since only one vegetation type occurs, it is classified as average density. Since the building shades the planting and protects it from wind, the microclimate is low and a k_{mc} value of 0.6 is assigned.

Case 6—A mixed planting of sweetgum, *Rhaphiolepis* sp., Wheeler's dwarf pittosporum, Raywood ash, and English ivy at a zoo in San Diego. The planting is mature (canopy cover is 100%), in full sun, and exposed to continual strong winds not typical for the area (i.e., windier than the reference ET location).

$$k_s = 0.5$$
$$k_d = 1.2$$
$$k_{mc} = 1.3$$
$$K_L = 0.5 \times 1.2 \times 1.3 = 0.78$$

Analysis: All species in this planting are classified as moderate in the WUCOLS list and are assigned a midrange value of 0.5. Since the canopy cover is 100% and all three vegetation types occur, this is a high density planting and a k_d of 1.2 is assigned. Since the site is atypically windy for the area, the microclimate is classified as high and a k_{mc} of 1.3 is assigned.

Case 7—A new planting of rockrose, manzanita, pink melaleuca, and bushy yate along a freeway in Monterey County. All plants are 5-gallon container stock, planted in full sun, and are not exposed to extraordinary winds. Canopy cover is 20 to 30%. A 4-inch layer of mulch covers the ground throughout the planting.

$$k_s = 0.2$$
$$k_d = 0.5$$
$$k_{mc} = 1.0$$
$$K_L = 0.2 \times 0.5 \times 1.0 = 0.1$$

Analysis: All species in this planting are classified as low in the WUCOLS list and a midrange value of 0.2 is given. Since this is a new planting and canopy cover is not full, it is placed in a low density category and assigned a k_d value of 0.5. The micro-

climate is average and assigned a value of 1.0. (See Chapter 8 for information on irrigating new plantings.)

These field examples should provide an understanding of how values for each of the landscape coefficient factors are assigned and used. In addition, an appreciation for the diversity of species, differences in vegetation density, and variation in microclimates which exist in landscapes should be realized. In many cases, there will be a different landscape coefficient for each irrigation zone.

For discussions of the following special planting cases, refer to Chapter 8:

- New Plantings
- Trees in Turf
- Individual Specimens
- Vines
- Herbaceous Plants

Landscapes vary considerably in species composition, vegetation density and microclimates.

Chapter 4— Using the Landscape Coefficient to Estimate Landscape Evapotranspiration

The landscape coefficient and reference evapotranspiration now are used to estimate landscape evapotranspiration for the plantings described in Chapter 3. This chapter completes the process used to produce estimates of landscape water loss. Subsequent chapters discuss how to use estimates of ET_L to calculate total irrigation water needs and how to apply this information in landscape management programs.

In Chapter 3, seven landscape planting cases were described and used for landscape coefficient calculations. These cases will be used here to calculate landscape evapotranspiration with the ET_L formula. The ET_L formula was described in Chapter 2 and is presented here for quick reference:

$$ET_L = K_L \times ET_o$$

Landscape Evapotranspiration =
Landscape Coefficient x Reference Evapotranspiration

For each case, reference evapotranspiration (ET_o) values will be taken from Appendix A. All are normal year average values for the month of July for the respective locations.

Case 1— $K_L = 0.5$
ET_o for San Jose = 7.44 inches

$ET_L = 0.5 \times 7.44 = 3.72$ inches

Case 2— $K_L = 0.24$
ET_o for Los Angeles = 6.5 inches

$ET_L = 0.24 \times 6.5 = 1.56$ inches

Case 3— $K_L = 0.8$
ET_o for Sacramento = 8.6 inches

$ET_L = 0.8 \times 8.6 = 6.88$ inches

Case 4— $K_L = 0.25$
ET_o for San Francisco = 4.9 inches

$ET_L = 0.25 \times 4.9 = 1.22$ inches

Case 5— $K_L = 0.30$
ET_o for Pasadena = 7.4 inches

$ET_L = 0.30 \times 7.4 = 2.22$ inches

Case 6— $K_L = 0.78$
ET_o for San Diego = 5.8 inches

$ET_L = 0.78 \times 5.8 = 4.59$ inches

Case 7— $K_L = 0.1$
ET_o for Monterey = 5.5 inches

$ET_L = 0.1 \times 5.5 = 0.55$ inches

These calculations show that landscape irrigation water needs vary substantially. Estimates range from 0.55 inches to 6.88 inches—more than a 12-fold difference.

The two factors used to determine ET_L, the landscape coefficient and reference evapotranspiration, are solely responsible for producing these differences in water loss estimates. For plantings in the same location (i.e., where the same ET_o values will be used), the differences will arise solely from the landscape coefficient. To produce useful estimates of water loss, therefore, it is important to carefully determine the value of K_L.

Even though the ET_L formula has given an estimate of water loss from a landscape, the total amount of irrigation water needed has not been determined. The total amount is calculated from two factors: ET_L and irrigation efficiency. The following chapter discusses irrigation efficiency and shows how it is used to determine the total amount of water to apply.

Chapter 5— Irrigation Efficiency and Calculating the Total Amount of Water to Apply

The first four chapters have described the process for estimating plant water needs. To calculate the total amount of water to apply, irrigation efficiency needs to be addressed. This chapter introduces the formula for calculating total water needs and discusses the irrigation efficiency factor. How this information applies to irrigation management is discussed in Chapter 6.

The ET_L formula calculates the amount of irrigation water needed to meet the needs of plants. This is not the total amount of water needed to apply, however. Since every irrigation system is inefficient to some degree, the landscape will require water in excess of that estimated by ET_L. In this chapter, irrigation efficiency will be discussed and then used to calculate the total amount of water to apply.

Irrigation Efficiency

Efficiency can be defined as the beneficial use of applied water (by plants). The following formula is used to calculate irrigation efficiency:

$$\text{Irrigation Efficiency (\%)} = \frac{\text{Beneficially Used Water}}{\text{Total Water Applied}} \times 100$$

An efficiency of 100% would mean that all applied water was used by the planting. This rarely occurs. Consequently, irrigation efficiency is less than 100% in virtually all cases and additional water should be applied to account for efficiency losses.

Not all water applied to landscapes is used by plants. Some is lost due to runoff, windspray, or deep percolation. Irrigation efficiency losses need to be included in water budget calculations.

A determination of irrigation efficiency (IE) for **landscape plantings** is challenging. As yet, a standard method has not been established. The approach used for turf irrigation, distribution uniformity (DU), is not appropriate for most landscape plantings.

Three approaches are considered here: calculation, estimation, and goal setting. Each method has **significant** limitations, and are presented here only as possible options to consider.

Calculation

To calculate irrigation efficiency, values for ET_L and TWA are needed. In landscapes, beneficially used water is the equivalent of ET_L (the amount of water estimated to be needed by a planting). This is calculated as described in Chapter 4. The total water applied can be determined by operating an irrigation system for a scheduled cycle and measuring the total water used (usually read from a water meter). The following example shows a typical calculation:

ET_L = 4 inches (calculated using the ET_L formula)
TWA = 5 inches (measured)

$$IE = \frac{ET_L}{TWA} \times 100 = 80\%$$

In the above example, the system has an 80% efficiency, or 8 out of every 10 gallons of applied water is used beneficially by the planting. Two gallons are lost, perhaps to runoff, evaporation, leakage, or wind spray. To supply 8 gallons of water means that a total of 10 gallons needs to be applied.

This approach has limited application for two reasons:

1. it requires a water meter to measure the amount of water applied, and
2. it may include efficiency losses associated with poor scheduling.

It assumes that applied water is close to optimum for the landscape plants and the system operating capabilities. It may be, however, that inefficiencies are linked to the operating schedule. For example, the irrigation duration may be too long for the planting.

Estimation

In cases where the total water applied cannot be measured, then irrigation efficiency may be estimated. Estimates are based on an assessment of the design and performance of the irrigation system. A system which is well designed and operated can have an efficiency range of 80% to 90%. Poorly designed and operated systems may have efficiencies of less than 50%. A representative range of efficiencies for landscape systems is proposed here to be from 65% to 90%.

Estimating is a subjective process where two assessments of the same system can vary widely. The utility of an estimate will be related to the knowledge and experience of the estimator.

Goal Setting

Irrigation efficiency values may also be based on a design and/or management goal. For instance, a new landscape may be designed to achieve an irrigation efficiency of 90%. Or, an existing landscape may be managed to achieve an irrigation efficiency of 85%. Both values represent efficiency goals. These efficiency values are then used to estimate the total water needed to achieve the goal. This approach is useful for water budgeting purposes, but does not provide a useful estimate of actual system performance.

All three of these methods are highly approximate. Until a standard method of measuring landscape irrigation efficiency is determined, however, they provide some guidance.

Total Water Applied

Regardless of the method used to determine irrigation efficiency, the total amount of water needed for a landscape planting is calculated using the following formula:

$$TWA = \frac{ET_L}{IE}$$

$$\text{Total Water Applied} = \frac{\text{Landscape Evapotranspiration}}{\text{Irrigation Efficiency}}$$

The following are examples of calculations using irrigation efficiency and landscape evapotranspiration to determine the total water to apply. The first three cases presented in Chapters 3 and 4 will be used. An irrigation efficiency value of 70% is assigned for each case.

Case 1— ET_L = 3.72 inches
IE = 70% or 0.7

$$TWA = \frac{3.72}{0.7} = 5.31 \text{ inches}$$

(see Case 1 in Chapter 4)

Case 2— ET_L = 1.56 inches
IE = 70% or 0.7

$$TWA = \frac{1.56}{0.7} = 2.22 \text{ inches}$$

Case 3— ET_L = 6.88 inches
IE = 70% or 0.7

$$TWA = \frac{6.88}{0.7} = 9.8 \text{ inches}$$

It is clear from these calculations that irrigation efficiency plays a very large role in determining the total amount of water to apply. Water added to account for efficiency losses ranges from 0.67 inches to 2.88 inches.

If the efficiency of the system is greater or less than 70%, the total water applied will vary accordingly. The magnitude of this effect can be seen in the following calculations where IE values from 30% to 90% are used. The ET_L value from the first sample calculation (3.72 inches) is used in each case.

@ 30% IE, $TWA = \frac{3.72}{0.3} = 12.4$ inches

@ 60% IE, $TWA = \frac{3.72}{0.6} = 6.2$ inches

@ 90% IE, $TWA = \frac{3.72}{0.9} = 4.1$ inches

These calculations indicate that for the same landscape plants, at the same location, and under identical environmental conditions, the total amount of water applied varies from 4.1 inches to 12.4 inches, due solely to irrigation efficiency differences. Clearly, the IE factor needs to be addressed very carefully when planning and managing landscapes.

Chapter 6— Putting It All Together: A Worksheet for Calculations

Chapters 1 through 5 have introduced a number of formulas and numbers that are used to estimate landscape water needs. This chapter puts all the equations together to show the calculation process. Subsequent chapters discuss considerations for applying estimates and special planting situations.

Three steps are needed to estimate irrigation water needs of a planting:

1. calculate the landscape coefficient,

2. calculate landscape evapotranspiration, and

3. calculate the total water applied.

These steps are combined in a worksheet format on the following page. After the worksheet, an example is given to show how it is used, followed by a discussion of converting units from inches of water to gallons.

Converting Inches to Gallons

Landscape evapotranspiration (ET_L) and total water applied (TWA) values have been given in units of inches. Frequently, it is of interest to know how many gallons of water are needed. Inches of water can be converted to gallons by using: 1) a conversion factor, and 2) a measure of the area to be irrigated.

1) The conversion factor, 0.62, can be used to convert inches-of-water-per-square-foot to gallons. A volume that is one-foot long, one-foot wide, and one-inch deep contains 0.62 gallons of water. This means that there are 0.62 gallons of water in a square-foot-inch. (There are 325,851 gallons in an acre-foot of water.)

2) The area to be irrigated needs to be measured. To use the conversion factor, units of square-feet are required.

With the area and the conversion factor, gallons of water can be calculated using the following formula:

Estimated water in gallons = estimated water in inches x area (square feet) x 0.62

Example: It was determined that 2.11 inches of water was needed for a groundcover planting. Let's say the planting covers 5,000 square feet.

To convert inches to gallons:

Gallons = 2.11 inches x 5,000 sq. ft. x 0.62 = 6,541

It is estimated that 6,541 gallons of water are needed to maintain the 5,000 square feet of groundcover.

Worksheet for Estimating Landscape Water Needs

Step 1: Calculate the Landscape Coefficient (K_L)

K_L formula: $K_L = k_s \times k_d \times k_{mc}$ ..... k_s = species factor
k_d = density factor
k_{mc} = microclimate factor

k_s = _____ (range = 0.1-0.9) (see WUCOLS list for values)

k_d = _____ (range = 0.5-1.3) (see Chapter 2)

k_{mc} = _____ (range = 0.5-1.4) (see Chapter 2)

K_L = _____ x _____ x _____ = _____ .
(k_s) (k_d) (k_{mc})

Step 2. Calculate Landscape Evapotranspiration (ET_L)

ET_L formula: $ET_L = K_L \times ET_o$ ..... K_L = landscape coefficient
ET_o = reference evapotranspiration

K_L = _____ (calculated in Step 1)

ET_o = _____ inches (listed in Appendix A for month and location)

ET_L = _____ x _____ = _____ inches.
(K_L) (ET_o)

Step 3. Calculate the Total Water to Apply (TWA)

TWA formula: $TWA = \frac{ET_L}{IE}$ ..... ET_L = landscape evapotranspiration
..... IE = irrigation efficiency

ET_L = _____ (calculated in Step 2)

IE = _____ (measured, estimated, or set) (see Chapter 5)

$TWA = \frac{ET_L}{IE}$ = _____ inches

Worksheet Example

A landscape manager in San Bernardino is interested in estimating water requirements for a large planting of African daisy (*Osteospermum fruticosum*) for the month of July. The planting is in an open area and is not exposed to extraordinary winds for the area. The manager estimates that irrigation efficiency is 70% and, using the work-sheet, follows the three steps (see below).

Step 1. $K_L = k_s \times k_d \times k_{mc}$

$k_s = 0.2$ (from WUCOLS list)
$k_d = 1.0$ (complete canopy cover and one vegetation type)
$k_{mc} = 1.0$ (open area, no extraordinary winds)

$K_L = 0.2 \times 1.0 \times 1.0 = 0.2$

Step 2. $ET_L = K_L \times ET_o$

$K_L = 0.2$ (from Step 1)
$ET_o = 7.4$ inches (for July in San Bernardino) (see Appendix A)

$ET_L = 0.2 \times 7.4 = 1.48$ inches

Step 3. $TWA = \frac{ET_L}{IE}$

$ET_L = 1.48$ inches (from Step 2)
$IE = 0.7$ (70% irrigation efficiency estimated by landscape manager)

$TWA = \frac{1.48 \text{ inches}}{0.7} = 2.11$ inches

(To convert 2.11 inches of water to gallons, see "Inches to Gallons".)

The landscape manager has estimated that the groundcover will need 2.11 inches of water for the month of July. Using this estimate, the manager can develop an irrigation schedule. Other factors may need to be considered before deciding if this estimate is appropriate for the planting. Chapter 7 addresses these considerations.

Chapter 7— Using Water Estimates in Landscape Planning and Management

Before water needs estimates are used for landscape planning and management purposes, a few points need to be considered. In Chapter 7, five special topics which are relevant to using estimates are addressed. The following chapter discusses some special planting situations.

The previous chapters have described how to estimate irrigation water needs for landscape plantings. These estimates can be used in landscape planning and management to:

- develop water budgets for planned or existing landscapes,
- assist in the design of landscapes to meet irrigation goals,
- assist in designing and managing effective hydrozones,
- help in the determination of irrigation system efficiency (i.e., along with measurements of total water use), and
- serve as an auditing tool by providing assessments of the amount of water landscapes need compared to that actually being used.

When using landscape water estimates for these purposes, however, a few considerations are important to note. These are discussed briefly under the following special topics headings.

Field Adjustments

The landscape coefficient method provides **estimates** of water needs, not exact values. Consequently, adjustments likely are needed in the field. If plants are showing signs of water stress, then an upward adjustment will be needed. Conversely, when it appears that too much water is being applied, then a downward adjustment is warranted. It is strongly recommended that when irrigation water estimates are implemented in the field that they be followed by careful monitoring.

Irrigation Schedules

An estimate of water needs is the first step in developing an irrigation schedule. Irrigation frequency, duration, and cycles also need to be determined to create a schedule. These are determined from the soil infiltration rate, rooting depth, sprinkler application rate, allowable depletion amounts, and soil water holding capacity. Each of these factors needs to be evaluated to determine how frequently to irrigate, how long to irrigate at any one time, and how many irrigation cycles are needed.

Soil Evaporation

Water loss may occur from the soil as well as from plants. This is most common when ground shading is less than 100% and a mulch is not present. The rate of evaporative water loss from soils depends on soil wetness, texture, structure, and density. When soil evaporation contributes to landscape water losses, water estimates should be increased by 10% to 20%. With sufficient mulching, however, bare soil surfaces will not be a source of water loss.

Salts and Leaching Fractions

When soil salt concentrations are sufficiently high to cause plant injury, the application of water in excess of that needed to meet plant needs is necessary. This process is called "leaching" and the percentage of applied water used to move salts below the root zone is called the "leaching fraction". For example, if 100 gallons of water is applied, and 25 gallons percolated below the root zone to remove salts, this would be a 25% leaching fraction. The leaching fraction needed for a landscape will depend on soil salt concentrations, tolerable levels, depth of the root zone, and soil physical properties. To determine an appropriate leaching fraction, it is recommended that managers consult with a qualified soil laboratory. The leaching fraction will add water to that needed for plants (ET_L), and the total water applied (TWA) will increase.

Reclaimed Water

The use of reclaimed water in landscape irrigation is becoming more common. Reclaimed water varies in quality, however, depending on the source and treatment process. Some reclaimed water is of high quality with little potential to injure plants. In other cases, reclaimed water may be of low quality, containing injurious levels of salts or specific elements. When irrigating with reclaimed water, planners and managers will need to assess and monitor water quality. Some upward adjustments in water estimates may be needed to reduce plant injury potential with low quality water. Consult a qualified laboratory when making such adjustments.

When irrigating with reclaimed water, planners and managers will need to monitor water quality. When irrigating with low quality reclaimed water, upward adjustments in water budgets may be needed to reduce the potential of plant injury.

Chapter 8— Special Planting Situations

Although the application of the landscape coefficient method has been described for many landscape cases, there are some special planting situations that require further consideration. These cases are described in Chapter 8. This concludes the process of making water needs estimates for landscape plantings. Remember, the appendices contain important reference information to use in calculations.

New plantings, trees in turf, individual plants, vines, and herbaceous plants represent special cases which require further consideration in making water needs estimates. All are common elements of landscapes.

New Plantings

In terms of irrigation water needs, the key differences between new and mature plantings are in density factor assignments and irrigation efficiency. Typically, canopy cover is substantially less in a new planting and the lowest k_d value, 0.5, is appropriate. Irrigation efficiency is also typically low for new plantings.

A landscape coefficient (K_L) calculation for a new planting was made in "Using the Landscape Coefficient Formula" (Chapter 3, example 7). In the example, a k_d value of 0.5 was used which produced a K_L of 0.1 (k_s = 0.2, k_{mc} = 1.0).

Based on experience, it may be thought that irrigating a new planting at one tenth of reference evapotranspiration is insufficient. Generally, landscape managers believe that new plantings need even more water than mature plantings. When irrigation efficiency (IE) is considered, however, the amount of water needed increases substantially. Indeed, it is because of very low efficiencies when irrigating new plantings that the total amount of water is much greater than that needed solely for the plants.

New landscape plantings require special consideration. The actual amount of water needed to maintain health and appearance in new plants is lower than that needed for established plantings (mainly because the density factor is low). However, irrigation efficiency losses are usually very high in new plantings, and the total amount of water needed may be equivalent to that of established plantings.

A sample calculation helps to show the role of irrigation efficiency in new planting irrigation. Using example 7, ET_L = 0.1 for a new planting in Monterey

County in July. The total amount of water needed is calculated using the TWA formula:

$$TWA = \frac{ET_L}{IE}$$

Selecting an irrigation efficiency of 10%,

$$TWA = \frac{0.1}{0.1} = 1.0 \text{ inch}$$

Ten times more water needs to be applied than that actually needed for the plants. This is based on a 10% irrigation efficiency for a new planting which is sprinkler irrigated. An IE of 10% is reasonable because most of the root mass of new plantings is confined to the rootball, with available water consisting of only that held in the rootball and, in some cases, a small volume of adjacent soil. Sprinklers deliver water to the entire planted area, not just the rootballs, so much of the water falls outside the usable area.

For instance, in a planting area of 100 sq. ft., only 10 sq. ft. may be occupied by rootball. Thus, if water is distributed uniformly, only 10% of the water applied falls in the root zone, which produces a 10% irrigation efficiency.

Irrigation efficiencies for some new plantings may be even less than 10%. If a planting is sparse and root zone occupies less than 10% of the irrigated area, and/or some of the water that lands on the rootball is lost to evaporation, percolation, or runoff, then IE may be less than 10%.

As roots develop into the adjacent soil, however, irrigation efficiency increases rapidly. For instance, if after one year, roots have developed into the adjacent soil to the point that half the planting area has some root mass, then water landing on half the area potentially may be absorbed by plants. In this case, irrigation efficiency has increased 5-fold to 50% (assuming no loss from runoff, evaporation, etc.).

It should be recognized that sprinkler irrigation of new plantings (i.e., of container grown plants) is not efficient. Other methods should be considered for water conservation purposes. Drip systems deliver water directly to rootballs and, therefore, have higher efficiency. Potentially, hand watering is also more water efficient than sprinkler irrigation, provided it is done carefully.

The water needs of most tree species planted in turf are generally met by the relatively high water needs of turf. Trees with relatively high water needs, such as these white alder (*Alnus rhombifolia*), should be used in turf areas.

As root development increases into the adjacent soil, sprinkler irrigation efficiency increases, while drip irrigation efficiency may actually decrease if emitters are not moved or supplemented to supply the larger root zone. Dual systems of both drip emitters and sprinklers may have the greatest potential for maximizing efficiency for new and developing plantings: the drip system being used for the new planting and the sprinklers employed once the root system has developed.

Trees in Turf

The water needs of most tree species planted in turf are generally met by the relatively high water needs of turf. Turf crop coefficients range from 0.6 (warm season species) to 0.8 (cool season species). This range is sufficient to satisfy the needs of all trees in the moderate, low, and very low WUCOLS categories. Trees in the high category may need supplemental water, particularly if they are planted in warm season turf. Trees in cool season turf are not likely to need supplemental water.

Aside from meeting total water needs, some other factors need to be considered regarding trees in turf:

1. ***Species Selection***. Not all tree species can be expected to perform well in turf. Species in the low and very low WUCOLS categories may be injured or killed by turf irrigation. Many species are adapted to dry summer conditions (e.g., oak species) and frequent irrigations associated with turf may result in root injury, typically from disease or poor aeration. Species selection is very important. When specifying trees in turf, species should be limited largely to those classified as "high" on the WUCOLS list. Species from the "moderate" category may be used in some cases, but there will be a greater potential for injury.

2. ***New Turf Around Established Trees***. When new turf (and associated irrigation) is installed around established trees, precautions are needed to avoid injury to the trees. This is particularly the case for trees that were not formerly irrigated. By supplying water to the root zone of established trees the potential for injury from disease or poor aeration increases substantially. Certain species (e.g., oaks) are more sensitive to such changes than other species. The root crown area is particularly sensitive and needs

In times when the water supply for turf becomes restricted (e.g., drought years), the water needs of trees in turf may not be met. These white birch (*Betula pendula*) died when water was withdrawn from the turf during a drought year. Notice that the juniper (*Juniperus sp.*) were not injured.

special consideration. To help ensure the survival of both the turf and trees in this situation, it is recommended that a certified arborist be consulted.

3. ***Drought Years***. In times when the water supply for turf becomes restricted (e.g., drought years), the water needs of trees in turf may not be met. During previous droughts in California, many trees in turf areas were severely injured or killed when water was withheld from turf. Frequently, the turf recovers when irrigation resumes, but the trees do not. It is very important to provide water directly to trees during such times.

4. ***Newly-Planted Trees***. Water supplied to meet turf needs is often not sufficient for newly planted trees in turf. Although turf irrigation is likely sufficient for most species once established, newly planted trees have special requirements. In most cases after planting, the roots of new trees are confined to the rootball, or a relatively small volume of soil. Much of the water supplied in turf irrigation (typically via sprinklers) does not rewet the rootball sufficiently. It is only the water that lands on the rootball that can be absorbed, and in most cases this is not adequate to meet the needs of the tree. As a result, many trees are very slow to develop in turf, and some are injured or killed. Supplemental water (delivered manually or by drip systems) are strongly recommended for trees in turf.

   In addition to special water needs, newly planted trees in turf also may be inhibited biologically by the turf. This is an effect known as "allelopathy," where one plant inhibits the development of another by the release of phytotoxic materials from its roots. Turf species are recognized as having allelopathic effects on young trees and, therefore, an area (2 ft. radius) around newly planted trees should be kept turf-free. Ideally mulch is applied to the soil surface in the turf-free zone to reduce evaporation and minimize the potential for mower or trimmer injury.

5. ***Shallow Rooting and Windthrow***. Turf irrigation typically supplies water to the surface 3 to 6 inches of soil, the active root zone for most turf species. Consequently, turf irrigations are relatively shallow and frequent (i.e., when compared to tree irrigation depths of 1 to 3 ft.). As a result, tree roots in turf areas tend to develop close to the soil surface. There has been some concern regarding the potential for reduced anchorage associated with shallow root systems of trees in turf. It is thought that large trees may have a higher potential for windthrow. Although this occurrence has been observed, there is no documentation to show that the potential for tree windthrow is higher in turf than elsewhere. Nevertheless, it is generally held that deep irrigations for trees in turf are beneficial. They not only increase the potential for root development deeper in the soil profile, but they also increase the size of the soil volume from which roots can extract water.

Individual Plants

To this point, the landscape coefficient method has been used to estimate water needs of plantings (i.e., groups of plants). It also can be used to estimate water needs of individual plants. The three factors (species, density, and microclimate) are used to determine a landscape coefficient as before. A few

considerations apply for individual plants, however, and they are discussed for shrubs and trees separately.

Shrubs

k_s: Species factor values are found in the WUCOLS list.

k_d: For most shrubs, an average density factor of 1.0 will be appropriate. For very large shrubs, an upward adjustment to 1.1 may be warranted.

k_{mc}: In most cases, the microclimate factor would be assigned as discussed in Chapter 2.

Trees

k_s: Species factor values are found in the WUCOLS list.

k_d: For small trees (< 15 feet tall), an average density factor of 1.0 would be appropriate. For larger trees, an upward adjustment to 1.1 or 1.2 accounts for the increase in leaf area found in many canopies.

k_{mc}: In most cases, the microclimate factor would be assigned as discussed in Chapter 2. For large trees, however, an upward adjustment to 1.2 or 1.3 to account for wind flow through the canopy may be appropriate.

Example: The urban forester for the city of Modesto is interested in estimating water needs for a large Modesto ash tree located in a downtown city plaza for the month of July.

Water needs for individual trees or shcubs can be estimated using the landscape coefficient method. Species, density and microclimate factors all need to be considered.

First, the forester needs to assign values for each of the landscape coefficient factors. In the WUCOLS list *Fraxinus velutina* 'Modesto' is classified as "moderate" with a k_s value of 0.4. Since this is a large, dense tree, the forester uses a density factor value of 1.1. The microclimate in the plaza warrants a "high" microclimate factor value. In addition, the forester wants to adjust for wind flow through the canopy since no trees or buildings are nearby to attenuate the wind. The forester selects a k_{mc} value of 1.5. Using these values, a calculation of the landscape coefficient can be made.

$$K_L = k_s \times k_d \times k_{mc}$$
$$K_L = 0.4 \times 1.1 \times 1.5 = 0.66$$

A species factor range of 0.4 to 0.8 is suggested to be appropriate for most annual species.

With the landscape coefficient calculated, the landscape evapotranspiration formula is used to calculate ET_L:

$$ET_L = K_L \times ET_o$$
$$K_L = 0.66$$
$$ET_o = 8.0 \text{ inches (for July in Modesto)}$$
$$ET_L = 0.66 \times 8.0 \text{ inches} = 5.28 \text{ inches}$$

The urban forester has estimated that the tree needs 5.28 inches of water for the month of July to maintain good appearance, health, and growth. A further adjustment to this value is needed to account for irrigation efficiency (see Chapter 5).

An alternative method for estimating water loss from an individual tree is described in Lindsey and Bassuk (1991). This method uses leaf area index (LAI) to account for density differences in tree canopies.

Vines

Vines occur in many landscapes and need to be considered in water loss estimates. Vines can contribute substantial leaf area to a planting whether they occur on walls, trellises, arbors, poles, or on the ground. Water needs evaluations for many vine species are included in the WUCOLS list. Although the microclimate factor (k_{mc}) will not be affected by the presence of vines, the density factor (k_d) is affected. Vines add another vegetation type or tier (in some cases) to a landscape and, therefore, increase the vegetation density. They also may contribute to canopy cover. Upward adjustments in k_d are likely needed when vines are present. These can range from small increases (0.1) to large (0.3) depending on the amount of vegetation (leaf area) added.

Annuals

Estimates of water needs for plantings of annual species can be made using the landscape coefficient formula. As for woody plantings, values for K_L and ET_o are needed. ET_o values are obtained as described previously, while K_L needs to be calculated from the three factors, k_s, k_d, and k_{mc}. The microclimate factor, k_{mc}, is determined as before, and k_d will range from 0.5 to 1.0 depending on the fullness of the plantings. The species factor, k_s, is more difficult to determine as many species are not included in the WUCOLS list. Generally, the water requirements of annual plants are relatively high and a k_s range of 0.4 to 0.8 is suggested for most species. By assigning values for k_s, k_d, and k_{mc}, the landscape coefficient, K_L, can be calculated and an estimate of water needs (ET_L) is determined.

Part 2

WUCOLS III*

1999 Edition

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*WUCOLS is the acronym for Water Use Classification of Landscape Species.

The WUCOLS list is intended solely as a ***guide*** to help landscape professionals identify irrigation water needs of landscape species. It can be used either for the selection of species or to assist in developing irrigation schedules for existing landscapes. It is ***not*** intended to be used as a "**required**," "**mandatory**," "**approved**," or "**master**" list by local, regional, or statewide governments, government agencies, or water authorities for the selection of plant species. This list should not be used in part or in entirety to restrict species selection only to those species listed here.

In addition, the evaluations of irrigation water requirements presented here should not be considered absolute and are not intended to be used as such, i.e., the user is not "**required**" to use these evaluations. This is a ***guide*** to species water needs.

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1998

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Introduction

Water conservation is an essential consideration in the design and management of California landscapes. Effective strategies that increase water use efficiency need to be identified and implemented. One key strategy to increase efficiency is that of matching water supply to plant needs. By supplying only the amount of water needed to maintain landscape health and appearance, unnecessary applications that exceed plant needs can be avoided. To do so, however, requires some knowledge of species needs.

This Guide provides irrigation water needs evaluations for over 1,900 species used in California landscapes. It is based on the observations and field experience of 41 knowledgeable landscape horticulturists in California (see list of Regional Committees). It was developed to provide guidance in the selection and maintenance of plants based on irrigation water needs. Specifically, it can be used to:

- assist landscape architects, designers, and planners in selecting plants for water efficient landscapes,
- assist landscape managers in evaluating water needs of existing plantings and in creating irrigation schedules that match species needs,
- provide options for landscape managers who wish to create hydrozones, i.e., to change species composition to reduce wide variations in water needs within plantings, and

The WUCOLS guide provides water needs evaluations for over 1900 species. Plants can be selected according to their water needs and grouped into water conserving hydrozones.

- provide a basis for estimating water needs for new landscapes.

The project was initiated and funded by the Water Use Efficiency Office of the California Department of Water Resources. Work was directed by the University of California Cooperative Extension (San Francisco and San Mateo County office). The first edition of the Guide was completed in 1992. A second edition was published in 1994, and this third edition was completed in 1999. In each edition, additional species evaluations have been included. The third edition was funded by the U.S. Bureau of Reclamation.

Getting Started

If you are using the Guide for the first time, we suggest you begin by reading the following sections on "Categories of Water Needs", "Standard Conditions", "Plant Types", and "Regions". These sections contain background information which is needed to use the Guide effectively.

If you have used the Guide before, and are familiar with the terms and the evaluation process, proceed directly to "Species Evaluations," page 62. Be advised, however, that new information has been introduced in WUCOLS III.

The following will help you locate information on important topics.

What does High, Moderate, Low and Very Low mean?
See "Categories of Water Needs," page 52.

What are Standard Conditions?
See "Standard Conditions," page 53.

What is meant by Plant Types ?
See "Plant Types," page 55.

What is meant by Regions?
See "Regions," page 56.

How do I calculate the right amount of irrigation water to apply?
See "Part 1" of this guide.

Is there more to know?
See "Other Important Information About the Guide," page 59 and "Appendix B, Invasive Species," page 143.

Cotinus coggygria, smoke tree, Low

Categories of Water Needs

The key question addressed by WUCOLS committee members was the following:

In order to be maintained in good condition, in the region of California being considered, and under the standard conditions outlined, does the species need high, moderate, low, or very low amounts of irrigation water?

This question served as the starting point for the evaluation process. After defining the terms "Regions" and "Standard Conditions" (see following sections), species were evaluated as needing High, Moderate, Low, and Very Low amounts of irrigation water. Expressed as a percentage of reference evapotranspiration (ET_o), these categories were quantitatively defined as follows:

High (H)	=	70 - 90% ET_o
Moderate (M)	=	40 - 60% ET_o
Low (L)	=	10 - 30% ET_o
Very Low (VL)	=	<10% ET_o

Water needs categories assigned for each species were determined by consensus of the committee. Assignments were made for each of six regions. When disagreements occurred, the higher water need category was assigned. For example, if some evaluators thought the species needed a "moderate" ranking, while others thought "low" was appropriate, then the "moderate" assignment was used.

Species assigned to the Very Low (VL) category were considered to need little or no irrigation during years of average rainfall.

If the committee did not have experience growing the species in the region, a question mark (?) was assigned. This does not imply that a species should not be tried.

If the species was considered inappropriate for the region, a forward slash (/) was assigned.

Using ET_o percentages, calculations of irrigation water requirements can be made. For example, a species assigned to the moderate (M) category is evaluated as needing between 40% and 60% of reference evapotranspiration to be maintained in good condition. Say, for the month of July, ET_o is 6 inches, then the species needs between 2.4 inches and 3.6 inches of irrigation water for the month. For more information on calculating water requirements for landscapes, see Part 1.

The following examples show how Categories of Water Needs are used.

Evaluations for *Acer macrophyllum*:

- Regions 1 and 3.....M (moderate)…....irrigate at 40-60% of ET_o
- Regions 2 and 4.....H (high)……irrigate at 70-90% of ET_o
- Regions 5 and 6..... / (not appropriate)

Evaluations for *Acacia smallii*:

- Regions 1, 2 and 5…. / (not appropriate)
- Region 3.....…....VL (very low)…. little or no irrigation needed
- Regions 4 and 6.….L (low)…….....irrigate at 10-30% of ET_o

Cerastium tomentosum, snow in summer, Medium

Evaluations for *Zexmenia hispida*:

- Regions 1, 2, 3, 4, 5 and 6……? committee members did not know species water needs

NOTES:

1. Reference evapotranspiration (ET_o) is defined in "Standard Conditions."

2. Cases where there are question marks in several regions usually indicate plants that are new to the nursery trade in California. Consult horticultural literature for more information about species water needs.

It is helpful to look at all the evaluations for each species, (i.e., for all six regions) to get a general assessment of species needs. If there is variation among regions for a species, looking at all evaluations for the species can help you select an irrigation level at the high or low end of the category's range.

Standard Conditions

The following conditions were applied to all species evaluations.

Established Plants

Species irrigation water needs are assessed for plants that have become "established" in the landscape. "Established" meaning that substantial root development has occurred in the landscape soil adjacent to the rootball. The landscape soil becomes the principal source of water for established plants rather than the rootball soil. The time for establishment varies among species and with soil conditions, but generally occurs by the second or third year after planting. After establishment, roots of trees, shrubs, groundcovers, etc., become intertwined in the soil, creating a common rootzone.

Reference Evapotranspiration Conditions (ET_o)

ET_o is defined as water loss from a large field of 4-to-7-inch-tall, cool-season grass that is not water stressed. Although ET_o can be measured directly, it is usually calculated from weather data. Daily ET_o information for many regions of the state is available through the California Irrigation Management Information System (CIMIS). Evaluations are made for site conditions equivalent to those used for ET_o measurements, i.e., full sun, no extraordinary winds, no shading from nearby structures or plants, and no heat inputs from nearby sources such as buildings, pavements, or reflective surfaces. As an exception,

shade-requiring species (e.g., Japanese aucuba) are evaluated for shade conditions. Shade species are considered to be those plants which when exposed to full sun for some part of the day will show visible injury. Since species vary in their shade requirements (for example, all day versus afternoon shade), any species requiring some shade to avoid injury (in the region) is evaluated for shade.

See "Appendix D, Additional Resources," for information on how to obtain CIMIS data.

Good Quality

Plant performance can vary substantially depending on the amount of water supplied. Small amounts may simply prevent the dehydration of plant tissues, but appearance is likely to be affected. Increasing amounts may improve appearance (leaf color, canopy density or fullness), but may not be enough to promote growth. More water may be sufficient to maintain good appearance and support typical (average) growth for the species (and flower or fruit production if desired). Still more water may result in excessive growth; while more water may cause decline (typically from root disease) in certain species. Since both appearance and some growth (not excessive) are important in most landscapes, evaluations were made to provide sufficient water for the species to be maintained as such, i.e., in good condition. This is somewhat difficult to evaluate precisely for some species, however, so whenever a question was raised as to whether a species required a greater or lesser amount of water to maintain good quality, the higher evaluation (more water) was assigned.

Groundwater Not Available

Although some species of plants develop root systems deep enough to extract groundwater (e.g., *Quercus lobata*), groundwater is not available in all planting sites. A species capable of extracting groundwater may not be able to do so because the water is simply not available. Therefore, evaluations are made for conditions where the only sources of water were rainfall and irrigation. In areas where groundwater is available and a species is known to utilize ground water, then adjustments in irrigation scheduling should be made for that species (or group of species).

Plants Must Be Irrigatable

In some cases the soil surface may be sealed around plants (particularly trees) by pavements or other surface barriers. This inhibits the infiltration of water into the rootzone. In other cases the soil volume capable of holding water may be so small and may dry so rapidly that it may be difficult to maintain available water in the rootzone. In either case, the amount of water identified as being needed to maintain good quality may not be sufficient simply because the plant is not "irrigatable." Evaluations made here assume as a standard condition that the species can be irrigated, i.e., the water applied can enter and be held in the rootzone sufficiently long for uptake.

Plant Types

The species list includes over 1,900 species of landscape plants which are identified by botanical and common names. The plants are listed alphabetically according to botanical names. An index of common names follows the species list.

Each plant falls into one or more of the following vegetation types: Trees, Shrubs, Groundcovers, Vines, Perennials (includes ferns, grasses, and bulbs) and Biennials. Plant types are entered on the list for each plant under "Type" as:

T..... Tree
S..... Shrub
V..... Vine
Gc..... Groundcover
P..... Perennial
Bi..... Biennial

Cultivars, with some exceptions, are not mentioned. It is presumed that most cultivars will have the same water requirements as the species. Examples of exceptions include the following:

1. *Nandina domestica* the cultivar '*Purpurea*' was included because it was thought to require more water than the species in three regions,

2. *Lonicera japonica* '*Halliana*' was included because the cultivar was thought to be more common than the species,

3. *Illicium floridanum* '*Alba*' was included because it was the only example of the species listed.

Turfgrasses

Turfgrasses were not evaluated by the committee. For your convenience, several turf species are listed in the "Species Evaluations" section. Water use requirements listed are from University of California Publication 21491, ***Turfgrass Evapotranspiration Map, Central Coast of California***. This publication also contains other important information regarding turfgrass irrigation such as regional ET variability, correcting for rainfall, dew, and fog and calculating sprinkler run times.

Rosa sp. climbing rose, High to Medium and *Solanum jasminoides,* potato vine, Medium

Regions

Since there are substantially different climate zones[1] in California, species are evaluated for six regions which represent different climatic conditions.

Region 1

North-Central Coastal (California Climate Zones 14, 15, 16, and 17) (CIMIS ET_o Zones 1, 2, 3, 4, 6 and 8)[2]

Region 2

Central Valley (California Climate Zones 8, 9 and 14), (CIMIS ET_o Zones 12, 14, 15, and 16)

Region 3

South Coastal (California Climate Zones 22, 23 and 24), (CIMIS ET_o Zones 1, 2, 4 and 6)

Region 4

South Inland Valleys and Foothills (California Climate Zones 18, 19, 20 and 21), (CIMIS ET_o Zone 9)

Region 5

High and Intermediate Desert (California Climate Zone 11), (CIMIS ET_o Zones 14 and 17)

Region 6

Low Desert (California Climate Zone13), (CIMIS ET_o Zone 18)

[1] California climate zones are described in University of California Publication 3328, ***Generalized Plant Climate Zones of California and Sunset Western Garden Book***.

[2] ET_o Zones are described in the ***California Irrigation Management Information System (CIMIS) Reference Evapotranspiration Map***, 1999 (see map on page 141).

Notes on Regions

Within each region there is some variability in climate patterns among the cities listed. For example, some cities may be considerably warmer than others during the summer months, yet they are within the same region. This variability can only be reduced by increasing the number of regions, which would cause the list to become enlarged and somewhat more complicated.

For certain locations (considered atypical for the region), it may be useful to consider evaluations from another region that more closely characterizes the location of interest. For example, if a city in Region 1 has a climate more closely characterized by Region 2, then Region 2 species evaluations should be considered for that location. Such assessments will need to be based on the judgement of the user.

If a city is not listed and is located in California Climate Zone 14 which overlaps regions 1 and 2, it will be necessary to decide if the city is more similar in climate to Petaluma (coastal influence) or Sacramento Valley.

If a city is located in a California Climate Zone which was not evaluated (zones 1, 2, 3, and 7—mainly high elevation, cold winter areas) an estimate may be made by looking at all the evaluations for the species in question. Hardiness is typically the major factor in determining if a species is appropriate or not.

The main difference between the California high and intermediate desert regions is that the high desert is colder in the winter; as the elevation increases so does the frequency of temperatures below freezing.

As a result, species which are listed as appropriate for the low desert and inappropriate for the high desert may be marginally hardy and appropriate to try in the intermediate desert.

Some Cities that Characterize Each Region

REGION 1 North-Central Coastal	REGION 2 Central Valley	REGION 3 South Coastal	REGION 4 South Inland Valley	REGION 5 Intermediate & High Desert	REGION 6 Low Desert
Concord	Auburn	Anaheim	Altadena	Apple Valley	Borrego Springs
Cupertino	Bakersfield	Camarillo	Azuza	Barstow	Blythe
Healdsburg	Chico	Fallbrook	Chino	Bishop	Brawley
Livermore	Coalinga	Fullerton	Corona	Boulder City	Coachella
Los Altos Hills	Fresno	Irvine	Covina	China Lake	Desert Center
Napa	Los Banos	Laguna Beach	El Monte	Gorman	Desert Hot Springs
Novato	Marysville	La Mesa	Escondido	Independence	Death Valley
Oakland	Merced	Long Beach	Hemet	Joshua Tree	El Centro
Petaluma	Modesto	Los Angeles	Ojai	Lancaster	Indian Wells
Salinas	Red Bluff	Mission Viejo	Pasadena	Lone Pine	Indio
San Francisco	Redding	Oxnard	Perris	Mojave	Jacumba
San Jose	Roseville	Santa Ana	Pomona	Olancha	Needles
San Luis Obispo	Sacramento	Santa Barbara	Ramona	Palmdale	Palm Desert
Santa Cruz	Stockton	San Diego	Riverside	Pear Blossom	Palm Springs
Santa Rosa	Tracy	San Juan Capistrano	San Bernardino	Tehachapi	Rancho Mirage
	Visalia	Santa Monica	San Fernando	Victorville	Thermal
		Ventura	Santa Paula		
		Vista	Sun City		
		Whittier	Thousand Oaks		
			Van Nuys		

Cistus purpureus, orchid rockrose, Low to Very Low

Other Important Information About the Guide

Variation in Regional Evaluations

Variation in species evaluations among regions occurs in many cases. Two patterns of variation are found:

1. where the variation ranges from less water needed in cooler climates to more in warmer ones, and

2. where less water is required in warmer climates than in cooler ones.

The following examples are typical cases:

Case 1— *Laurus nobilis*, sweet bay

1	2	3	4	5	6
L	L	L	L	M	M

This is the most common variation. It merely indicates that certain species were thought to require more water in warmer climates.

Case 2—*Gleditsia tricanthos*, honey locust

1	2	3	4	5	6
L	L	M	L	L	L

A warmer region indicates a lower water requirement than a cooler region. This case reflects differences in observation and experience among regional committees.

Zauchneria spp., California fuchsia

1	2	3	4	5	6
L	L	VL	L	/	M

This example shows both cases. Sometimes, for certain California natives and other drought tolerant species, there was agreement that the plant would grow with little or no irrigation, but opinions varied as to how well it would perform in a managed landscape under those conditions.

Drought Stress/Insect Attack Relationships

Although some species perform well with little or no irrigation water, their susceptibility to insect attack and injury may increase with water stress. For example, many Eucalyptus species perform well in non-irrigated conditions in many parts of California. When drought stressed, however, they become susceptible to attack and injury from the Eucalyptus long-horned borer. This is the case as well for Monterey pine (California five-spined engraver beetle) and white alder (Flatheaded borer). For these species, evaluations were made with consideration given to water stress and pest interactions. For example, although Eucalyptus globulus will perform well in Regions 3 and 4 with little summer water, it was assigned to the “moderate” category to minimize its susceptibility to borer injury.

Shade

Most species were evaluated for full sun conditions. Light intensity and duration varies with seasons, microclimates and proximity to the coast. Many

species which can be grown in full sun in coastal locations require a measure of shade in inland areas. Others require some shade in all locations. Here, each species was evaluated for the conditions which would produce best appearance and flowering or fruit production for the region. Because of the lack of a standard method for identifying species shade requirements, however, plants needing shade are not noted on the list. Consult horticultural literature for more information on species light requirements.

Rhus lancea, African sumac, Medium to Low

Winter Irrigation

Although deciduous species are not typically irrigated in the winter months, there may be some need to do so in desert regions. Warm, windy conditions can dehydrate shoots and buds. In addition, some evergreen species may need winter irrigation during drought years or in desert climates.

Summer Deciduous Species

As a drought adaptation, certain species shed their leaves when soil moisture level become low (e.g. California buckeye). Usually, such species do not require irrigation water and are designated Very Low on the list. In cases of low spring rainfall, or when retention of summer leaves is desired, irrigation may be needed.

Special Conditions

Special conditions such as new plantings or a need for rapid growth may require upward adjustments in species water needs.

Revegetation Species

Species selected for revegetation sites should be limited to those which are well adapted to the location and do not require irrigation after establishment. Species used principally for revegetation (i.e., not typically used in irrigated landscape, such as mule fat and poison oak) are not included on the species list.

Invasive Species

Certain species considered invasive both in wildland areas and managed landscapes are available in California nurseries. Their inclusion on this list is not meant to encourage their use, but to alert you that these species can be invasive. For detailed information, see “Invasive Species” (Appendix B).

Using Field Data

Although substantial information exists on the irrigation water needs of agricultural species and turfgrasses, little information is available for woody and herbaceous landscape species. Field studies have quantified the irrigation requirements for six groundcover species (Pittenger, 1990) and three tree species (Hartin, 1991). This information has been used in these evaluations. Considering that over 1,900 tree, shrub, groundcover, vine, and perennial species are available from California nurseries, however, a considerable amount of work still needs to be done before field data alone can be used to determine species water needs.

Limitations of the List

This list is limited in a number of ways:

1. It is subjective (i.e., it is based largely on field observations rather than scientific data). As such, evaluations are not definitive and may change as more research-based information becomes available.

2. It is a partial list—not all landscape species are included. It is a large list which includes most plants available from California nurseries, but it does not include all plants. Additions to the list are expected as new species are introduced or less common species are evaluated.

3. Not all regions of California are included in the evaluations. Extrapolations may be needed from a region evaluated to one that is not.

Astilbe hybrid, false spirea, High to Medium

Species Evaluations

The three plant species listed below are examples of entries on the Species Evaluation List. As a quick reference, a key to symbols is included below. For more information on terms and the evaluation process, see previous sections.

			1	2	3	4	5	6	
T	Ailanthus altissima	tree of heaven	VL	VL	L	L	L	L	☹
S	Brugmansia spp.	angel's trumpet	M	/	M	H	/	/	
Gc	Dodonaea procumbens	hopseed	L	L	L	?	?	?	

Key to Symbols

CATEGORIES OF WATER NEEDS

H High
M Moderate
L Low
VL Very Low
/ Inappropriate
? Unknown

PLANT TYPES

T Tree
S Shrub
V Vine
Gc Groundcover
P Perennial (includes ferns, grasses and bulbs)
Bi Biennial

WUCOLS REGIONS

1 North Central Coastal
2 Central Valley
3 South Coastal
4 South Inland Valley
5 High and Intermediate Desert
6 Low Desert

INVASIVE SPECIES

☹☹ Greater Statewide Concern
☹ Lesser Statewide Concern

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
S	Abelia chinensis	Chinese abelia	M	?	?	?	/	/	
S	Abelia floribunda	Mexican abelia	M	?	M	M	/	/	
S Gc	Abelia X grandiflora	glossy abelia	M	M	M	M	/	/	
S	Abelia 'Sherwoodii'	Sherwood dwarf abelia	M	M	M	M	/	/	
T	Abies spp.	fir	M	/	M	M	/	/	
T	Abies pinsapo	Spanish fir	L	/	L	/	/	/	
S	Abutilon X hybridum	flowering maple	M	H	H	H	/	/	
S	Abutilon palmeri	indian mallow	?	?	L	?	?	?	
S T	Acacia abyssinica	Abyssinian acacia	/	?	/	?	/	L	
T	Acacia aneura	mulga	/	?	?	?	/	L	
T	Acacia baileyana	Bailey acacia	L	L	L	L	/	/	☹
T S	Acacia berlandieri	guajillo	?	?	?	M	/	L	
T	Acacia boormanii	Snowy River wattle	?	?	L	?	?	?	
T	Acacia cognata (A.subporosa)	bower wattle	L	L	M	M	/	/	
T S	Acacia constricta	whitethorn acacia	?	L	L	L	L	L	
T S	Acacia craspedocarpa	leatherleaf acacia	?	?	?	?	L	L	
T	Acacia cultriformis	knife acacia	L	L	L	L	/	/	
T	Acacia dealbata	silver wattle	VL	L	L	L	/	/	☹
T	Acacia decurrens	green wattle	VL	L	L	L	/	/	☹
T	Acacia farnesiana	sweet acacia	?	?	L	L	/	L	
S	Acacia glaucoptera	clay wattle	L	/	L	L	/	/	
T S	Acacia greggii	catclaw acacia	L	L	L	L	L	L	
T S	Acacia longifolia	Sydney golden wattle	L	L	L	L	/	/	☹
T	Acacia melanoxylon	blackwood acacia	VL	L	L	L	/	/	☹
T	Acacia pendula	weeping acacia	L	L	M	M	/	L	
T	Acacia pennatula	pennatula acacia	?	?	VL	?	L	L	
T S	Acacia podalyriifolia	pearl acacia	VL	VL	L	M	/	/	
S Gc	Acacia redolens	prostrate acacia	VL	VL	L	L	L	L	
S	Acacia rigens	needleleaf acacia	/	/	?	?	?	?	
T	Acacia rigidula	rigidula acacia	/	/	?	?	?	?	
T	Acacia salicina	willow acacia	L	L	L	M	/	M	
T S	Acacia saligna	blue leaf wattle	L	L	L	L	/	M	
T	Acacia schaffneri	twisted acacia	/	/	?	?	/	L	
T	Acacia smallii	desert sweet acacia	/	/	VL	L	/	L	
T	Acacia stenophyla	eumong/shoestring acacia	VL	L	L	L	/	L	
T S	Acacia subporosa	subporosa acacia	L	/	L	?	?	?	
S	Acacia vestita	hairy wattle	?	?	L	L	?	?	
T	Acacia willardiana	palo blanco	/	/	?	L	/	L	
P	Acanthus mollis	bear's breech	M	M	M	M	/	M	
T S	Acca sellowiana (Feijoa sellowiana)	pineapple guava	L	L	L	M	/	M	
T	Acer buergerianum	trident maple	M	M	M	/	/	/	
T	Acer campestre	hedge maple	M	M	?	?	/	/	
T S	Acer circinatum	vine maple	M	H	/	/	/	/	
T	Acer X freemanii	Freeman maple	M	M	?	?	?	?	
T	Acer griseum	paperbark maple	M	M	?	?	?	?	
T	Acer macrophyllum	big leaf maple	M	H	M	H	/	/	
T	Acer negundo	box elder	M	M	M	M	/	/	
T	Acer oblongum	evergreen maple (oblongum)	M	/	M	M	/	/	
T	Acer palmatum	Japanese maple	M	M	H	H	/	/	
T	Acer paxii	evergreen maple (paxii)	M	M	M	M	/	/	
T	Acer platanoides	Norway maple	M	M	/	H	/	/	
T	Acer rubrum	scarlet red maple	M	H	H	H	/	/	
T	Acer saccharinum	silver maple	M	M	/	M	/	/	
T	Acer saccharum	sugar maple	M	/	/	/	/	/	
T	Acer tataricum ssp. ginnala	amur maple	M	M	?	?	?	?	
T	Acer truncatum	Chinese maple	M	M	/	H	/	/	
P	Achillea ageratifolia	Greek yarrow	L	M	M	M	M	M	
P	Achillea clavennae	silvery yarrow	L	L	L	L	/	/	
P	Achillea filipendulina	fern leaf yarrow	L	L	L	L	M	M	
P	Achillea X kellerii	kellerii achillea	M	?	L	?	?	?	
P	Achillea millefolium & hybrids	common yarrow	L	L	L	L	M	M	☹

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
Gc P	Achillea tomentosa	woolly yarrow	L	L	L	L	M	M	
P	Aconitum napellus	garden monkshood	M	M	/	/	/	/	
P	Acorus gramineus	sweet flag	H	H	H	H	H	H	
V	Actinidia arguta	kiwi/Tara	M	M	M	?	/	/	
V	Actinidia deliciosa	kiwi	H	H	H	H	/	/	
S	Adenanthos drummondii	woolly bush	?	?	L	?	?	?	
S	Adenanthos sericea	woolly bush	L	?	?	?	?	?	
P	Adenophora bulleyana	ladybells	H	?	?	?	?	?	
P	Adenophora liliifolia	lilyleaf ladybells	H	?	M	?	?	?	
S	Adenostoma fasciculatum	chamise	VL	VL	VL	VL	/	/	
T S	Adenostoma sparsifolium	red shanks/ribbonwood	VL	?	VL	VL	/	/	
P	Adiantum spp.	maidenhair fern	H	H	H	H	H	H	
S P	Aeonium spp.	Canary Island rose	L	/	L	L	/	L	
T	Aesculus californica	California buckeye	VL	VL	VL	L	/	/	
T	Aesculus X carnea	red horsechestnut	M	M	M	M	/	/	
T S	Aesculus pavia	red buckeye	M	?	?	?	?	?	
P	Aethionema armenium 'Warley Rose'	Warley rose stone cress	M	?	?	?	?	?	
T	Afrocarpus gracilior (Podocarpus gracilior)	African fern pine	M	M	M	M	?	M	
S	Agapetes 'Ludgvan Cross'	Ludgvan cross agapetes	M	?	M	?	?	?	
S	Agapetes serpens (Pentapetpterygium)	agapetes (serpens)	M	?	M	?	?	?	
P	Agapanthus africanus	lily-of-the-Nile	M	M	M	M	/	M	
P	Agapanthus campanulatus		M	M	M	M	/	M	
P	Agapanthus inapertus major		L	?	M	M	/	M	
P	Agapanthus praecox spp. orientalis & cvs		M	M	M	M	/	M	
P	Agastache aurantica	giant hyssop	M	M	M	M	M	M	
P	Agastache cana	mosquito plant	M	M	M	M	M	M	
P	Agastache coccinea pink	agastache	M	M	M	M	M	M	
P	Agastache rugosa	wrinkled agastache	M	M	M	M	M	M	
T	Agathis australis	Australian agathis/ kauri	M	/	M	/	/	/	
T	Agathis robusta	Queensland kauri	M	/	M	M	/	/	
S P	Agave spp.	agave	L	L	L	L	/	L	
T	Agonis flexuosa	peppermint tree	L	/	L	M	/	/	
P	Agyranthemum 'Chelsea girl'	agyranthemum	?	?	M	M	?	?	
T	Ailanthus altissima	tree of heaven	VL	VL	L	L	L	L	☹
Gc	Ajuga reptans	carpet bugle	M	M	M	H	H	H	
V	Akebia quinata	fiveleaf akebia	M	M	M	M	/	/	
T	Albizia distachya	plume albizia	L	/	L	/	/	/	☹
T	Albizia julibrissin	silk tree	L	L	M	M	M	M	
T	Alectryon excelsus	alectryon/titoki	M	/	M	/	/	/	
V	Allamanda cathartica	golden trumpet vine	/	/	M	/	/	/	
P	Allium spp.	allium	M	M	M	M	?	?	
T	Allocasuarina torulosa	forest oak	L	?	?	/	?	?	
T	Allocasuarina verticillata (Casuarina stricta)	coast beefwood	L	L	L	L	M	M	
T	Alnus cordata	Italian alder	M	M	M	M	/	/	
T	Alnus glutinosa	black alder	M	M	M	H	/	/	
T	Alnus oregona	Oregon alder	H	H	/	/	/	/	
T	Alnus rhombifolia	white alder	H	H	H	H	H	/	
P	Alocasia spp.	elephant's ear	H	H	H	H	/	/	
T S	Aloe spp.	aloe	L	L	L	L	/	L	
P	Alonsoa warscewiczii	alonsoa	M	?	M	?	?	?	
P	Alopecurus pratensis 'Aureus'	golden foxtail	?	?	M	?	?	?	
S	Aloysia machrostachya	aloysia	?	?	?	?	L	L	
S	Aloysia triphylla	lemon verbena	L	L	L	L	L	L	
S P	Alpinia zerumbet	shell ginger	H	/	H	H	/	H	
P	Alstroemeria spp.	Peruvian lily	M	M	M	M	?	M	
S	Alyogyne hakeifolia	red centered hibiscus	/	/	L	L	/	/	
S	Alyogyne huegelii	blue hibiscus	L	L	L	L	/	L	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
P	Alyssum montanum	mountain alyssum	L	L	?	?	?	?	
P	Amaryllis belladona	naked lady	VL	VL	VL	L	L	L	
S	Ambrosia deltoidea	triangleleaf bursage	?	?	?	?	L	L	
S	Ambrosia dumosa	white bursage	?	?	/	/	L	L	
S	Amorpha fruiticosa	false indigobush	?	?	?	?	M	?	
V	Ampelopis brevipedunculata	blueberry creeper	M	M	/	M	M	M	
P	Anaclycus pyrethrum var depressus	Mount Atlas daisy	?	?	?	?	?	?	
P	Anagallis monellii	pimpernel	?	?	M	/	/	/	
S Gc	Andromeda polifolia	bog rosemary	H	H	/	/	/	/	
P	Androsace lanuginosa	rock jasmine	M	?	?	?	?	?	
P	Anemone X hybrida	Japanese anemone	M	M	M	M	M	M	
P	Anemone pulsatilla (see Pulsatilla vulgaris)								
P	Anemone sylvestris	snowdrop windflower	?	?	M	?	?	?	
V	Anemopaegma chamberlaynii	yellow trumpet vine	?	?	M	M	/	/	
P Gc	Anemopsis californica	yerba mansa	?	?	?	?	H	H	
P	Angelonia angustifolia	angel flower	?	?	M	?	?	?	
T	Angophora cordifolia (Angophora costata)	gum myrtle	L	/	L	M	/	/	
P	Anigozanthos flavidus	kangaroo paw	L	L	L	L	/	M	
P	Anigozanthos viridis	green kangaroo paw	L	L	L	L	/	M	
S	Anisacanthus spp.	desert honeysuckle	?	?	L	L	L	L	
S	Anisodontea X hypomadarum	South African mallow	M	M	M	M	/	M	
S	Anisodontea scabrosa	false mallow	M	M	M	M	/	M	
T	Annona cherimola	cherimoya	M	/	M	M	/	/	
P	Antennaria rosea	pussy toes	L	L	?	?	?	?	
P	Anthoxanthum odoratum	sweet vernal grass	M	?	?	?	?	?	
Gc V	Antigonon leptopus	coral vine	M	/	L	L	/	L	
Gc	Aptenia cordifolia	ice plant (Aptenia)	L	L	L	L	/	H	
GC	Aptenia 'Red Apple'	ice plant (Red Apple)	L	L	L	L	/	H	☹
P	Aquilegia spp.	columbine	L	L	M	M	M	M	
P	Arabis spp.	rockcress	L	M	M	?	?	?	
V	Araujia sericifera	cruel vine	?	?	L	?	?	?	
T	Araucaria araucana	monkey puzzle tree	L	M	/	M	/	/	
T	Araucaria bidwilii	bunya-bunya	L	M	M	M	/	/	
T	Araucaria heterophyla	Norfolk Island pine	M	M	M	/	/	/	
T	Arbutus 'Marina'	Marina arbutus	L	L	M	M	/	/	
T	Arbutus menziesii	madrone	L	L	/	/	/	/	
T S	Arbutus unedo	strawberry tree	L	L	L	L	M	M	
T	Archontophoenix cunninghamiana	king palm	M	M	M	M	/	/	
S Gc	Arctostaphylos cultivars	manzanita cultivars	L	L	L	L	/	/	
S T	Arctostaphylos diversiloba (Comarostaphylis diversiloba)	summer holly	VL	L	VL	L	/	L	
S Gc	Arctostaphylos spp.	manzanita	VL	L	L	L	/	/	
Gc P	Arctotheca calendula	cape weed	M	M	M	M	/	M	☹
P	Arctotis hybrids	African daisy	M	M	L	L	/	M	
Gc	Ardisia japonica	Japanese ardesia, marlberry	M	/	H	/	/	/	
T	Arecastrum romanzoffianum (See Syagrus romanzoffiana)								
	Arenaria spp. (See Sagina)	Irish, Scotch moss							
P	Arenaria montana	sandwort	?	M	M	M	?	?	
S	Arenga engleri	Ryukyu Island palm	?	?	M	?	?	?	
P	Argyranthemum frutescens	Marguerite daisy	M	M	M	M	/	M	
P	Aristea ecklonii	little Tyler/blue stars	M	?	M	M	/	/	
P	Aristea major	tall aristea	M	?	?	?	?	?	
V	Aristolochia californica	California Dutchman's pipe	L	L	?	M	/	/	
V	Aristolochia durior	Dutchman's pipe	M	M	?	M	/	/	
V	Aristolochia elegans	calico flower	/	/	M	M	/	/	
P	Armeria alliacea	sea pink							
P	Armeria caespitosa (A. juniperifolia)	thrift	?	?	M	M	M	M	
Gc P	Armeria maritima	sea pink	M	M	M	M	M	M	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
P	Armeria setacea	thrift	?	?	M	M	M	M	
P	Arnica montana	arnica	M	?	?	?	?	?	
P	Arrhenatherum elatius ssp bulbosum	bulb oat grass	?	?	M	M	M	M	
S Gc	Artemisia spp. (shrubby)	sagebrush	VL	L	L	L	L	L	
Gc P	Artemisia spp. (herbaceous)	tarragon/angel's hair etc.	L	L	L	L	M	M	
P	Arthropodium cirrhatum	star lily	M	?	M	?	/	/	
P	Arum italicum	Italian Arum	VL	L	VL	?	?	?	
P	Arundo donax	giant reed	M	M	M	M	M	M	☹ ☹
	Arundinaria (See Chimonobambusa, Drepanostachyum, Pleioblastus, Semiarundinaria, Thamnocalamus & other genera)								
P	Arundinaria gigantea	cane reed	L	L	M	M	/	M	
V	Asarina antirriniflora (Maurandya)	snapdragon vine	M	?	M	?	/	M	
V	Asarina barclaiana (Maurandya)	climbing snapdragon	M	?	M	?	?	?	
V	Asarina erubescens (Maurandya)	creeping gloxinia	M	?	M	?	?	?	
Gc P	Asarum caudadum	wild ginger	M	M	H	?	/	/	
P	Asclepias tuberosa	butterfly weed	M	M	M	M	M	M	
P	Asclepias (wild species)	milk/silk weed	L	L	L	L	L	L	
P	Asparagus spp.	ornamental asparagus	M	M	M	M	/	M	
P	Asphodeline lutea	Jacob's rod/kings spear	L	?	?	?	?	?	
P	Asphodeline taurica	Asphodel	L	?	?	?	?	?	
P	Aspidistra elatior	cast iron plant	L	L	M	M	/	M	
P	Asplenium bulbiferum	mother fern	M	M	H	H	/	/	
P	Asplenium nidus	bird's nest fern	M	M	H	/	/	/	
P	Asplenium scolopendrium (Phyllitis)	Hart's tongue fern	L	?	L	?	?	?	
P	Astelia nervosa chathamica	silver spear	M	/	M	?	?	?	
P	Astelia nivicola	astelia	M	?	?	?	?	?	
P	Aster spp.	aster	M	M	M	M	M	M	
P	Asteriscus maritimus	gold coin, Canary Island daisy	M	M	L	M	/	/	
P	Asteriscus sericeus (See Naupilus sericecus)								
P	Astilbe hybrids	false spirea	M	H	/	/	/	/	
P	Astrantia major rosea	greater masterwort	M	M	?	?	?	?	
S	Athanasia acerosa	athanasia	L	?	?	?	?	?	
P	Athyrium filix-femina	lady fern	M	H	H	H	H	/	
P	Athyrium nipponicum 'Pictum'	painted lady fern	M	M	?	?	?	?	
S Gc	Atriplex spp.	saltbush	VL	VL	VL	VL	L	VL	☹
P	Aubrieta deltoidea	rock cress	L	M	?	?	?	?	
S	Aucuba japonica	Japanese aucuba	M	M	M	M	/	M	
P	Aurinia saxatilis	hardy alyssum/basket of gold	L	L	M	M	?	?	
T	Azadirachta indica	neem	M	?	?	?	?	?	
S	Azaliadendron 'Hardjizer's Beauty'	Hardijizer's beauty	M	?	?	?	?	?	
S T	Azara dentata	orono	M	/	M	?	/	/	
S T	Azara integrifolia	azara	M	/	M	?	/	/	
S T	Azara microphylla	box leaf azara	M	/	M	M	M	/	
P	Babiana stricta hybrids	baboon flower	L	L	L	?	/	/	
S	Baccharis pilularis consanguinea	coyote brush	L	L	L	L	/	/	
S Gc	Baccharis pilularis cvs.	dwarf coyote brush	L	L	L	L	/	/	
S	Baccharis sarothroides	desert broom	VL	L	VL	L	L	L	
S Gc	Baccharis 'Centennial'	bentennial baccharis	VL	L	VL	L	L	L	
	Bacopa 'Snowflake' (See Sutera spp.)								
S T	Baeckea virgata	tall baeckia	L	?	?	?	?	?	
P	Baileya multiradiata	desert marigold	?	?	?	L	L	L	
P	Ballota pseudodictamnus	Grecian horehound	VL	VL	?	?	?	?	
S	Bambusa spp.	bamboo (Bambusa)	L	L	M	M	M	M	
P S	Banksia ericifolia	heath-leafed banksia	L	?	?	?	?	?	
T S	Banksia integrifolia	tree banksia	L	/	M	M	/	M	
T S	Banksia praemorsa	cut-leaf banksia	?	?	?	?	?		
T S	Banksia speciosa	showy banksia	L	/	M	?	/	M	
P	Baptista australis	false indigo	L	L	?	?	?	?	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
S	Barleria obtusa	barleria	?	?	M	M	/	/	
T	Bauhinia X blakeana	Hong Kong orchid tree	M	/	M	M	/	M	
V	Bauhinia corymbosa	phanera	?	?	M	?	/	M	
T	Bauhinia forficata	Brazilian butterfly tree	M	M	M	M	/	/	
T S	Bauhinia galpinii	red orchid bush	L	\	M	M	/	/	
	Bauhinia punctata (see galpinii)								
T	Bauhinia variegata (purpurea)	purple orchid tree	M	/	M	M	/	M	
P	Baumea rubiginosa	baumea	?	?	H	?	?	?	
T S	Beaucarnea recurvata (See Nolina recurvata)								
V	Beaumontia grandiflora	Easter lily vine	M	/	M	H	/	/	
P	Begonia fuchoides rosea	fuchsia begonia	M	M	M	M	/	/	
P	Begonia grandis	hardy begonia	M	M	M	M	/	/	
P	Begonia 'Richmondensis'	Richmond begonia	M	M	M	M	/	M	
P	Begonia semperflorens	Wax begonia	M	M	M	M	/	M	
P	Bellis perenis	English daisy	M	M	M	M	/	/	
S V	Berberidopsis corallina	coral plant	M	?	?	?	?	?	
S GC	Berberis spp.	barberry	L	L	L	L	L	M	
Gc	Berberis X stenophylla 'Irwinii'	barberry	M	M	M	?	M	M	
P	Bergenia cordifolia	heartleaf bergenia	M	M	M	H	H	H	
P	Bergenia crassifolia	winter blooming bergenia	M	M	M	H	H	H	
P	Berlandiera lyrata	chocolate scented daisy	?	M	?	M	M	M	
P	Beschorneria yuccoides	Mexican lily	/	/	M	?	?	?	
T	Betula fontinalis (occidentalis)	water birch	H	/	H	H	/	/	
T	Betula utilis var. jaquemontii	white barked Himalayan birch	H	H	/	/	/	/	
T	Betula nigra	river/red birch	H	H	H	H	/	/	
T	Betula occidentalis (See B. fontinalis)								
T	Betula pendula	European white birch	H	H	H	H	/	/	
T	Betula platyphyla japonica	Japanese mountain birch	H	H	?	?	?	?	
P	Bidens triplinervia	tickseed	VL	?	?	?	?	?	
V	Bignonia capreolata	cross vine	M	?	?	?	?	?	
P	Billbergia spp.	queen's tears etc.	M	/	M	M	/	M	
T	Bischofia javanica	toog	/	/	M	?	/	/	
P	Blechnum occidentale	hammock fern	H	?	H	?	?	?	
P	Blechnum penna-marina	alpine water fern	?	?	?	?	?	?	
P	Blechnum spicant	deer fern	L	?	M	?	?	?	
P	Bletilla striata	hyacinth orchid	M	M	M	?	?	?	
P	Bolax gummifera (glebaria)	bolax/glebaria	M	?	?	?	?	?	
S	Boronia spp.	boronia	M	/	M	/	/	/	
P	Bothriochloa barbinoides	cane bluestem	L	?	?	?	?	?	
S Gc	Bougainvillea spp.	bougainvillea	L	L	L	L	/	M	
P	Bouteloua curtipendula	sideoats gramma	VL	L	?	?	?	?	
P	Bouteloua gracilis	blue gramma	L	L	?	?	M	?	
T	Brachychiton acerifolius	flame tree	L	/	L	M	/	/	
T	Brachychiton discolor	Queensland lace bark	M	/	L	M	/	/	
T	Brachychiton X hybridus	hybrid brachychiton	M	/	M	M	/	M	
T	Brachychiton populneus	bottle tree	L	L	L	L	M	M	
T	Brachychiton rupestris	Queensland bottle tree	/	/	L	L	/	M	
P	Brachycome spp.	Swan River daisy	M	M	M	M	M	M	
P	Brachyglottis greyi (Senecio greyi)	groundsel	L	?	M	?	?	?	
T	Brahea armata	blue hesper palm	L	L	L	L	L	L	
T	Brahea brandegeei	San Jose hesper palm	L	?	M	?	?	?	
T	Brahea edulis	Guadalupe palm	L	?	L	L	L	L	
	Brassaia actinophylla (See Schefflera actinophylla)								
	Bravoa geminiflora (See Polyanthes geminiflora)								
S	Breynia nivosa (distacha)	Hawaiian snow bush	?	?	H	H	/	/	
P	Briza media	quaking grass	L	?	M	M	M	M	☹
P	Brodiaea spp.	brodiaea	VL	VL	L	L	/	/	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
S	Brugmansia spp.	angel's trumpet	M	/	M	H	/	/	
S	Brunfelsia pauciflora	yesterday today and tomorrow	M	M	M	H	/	H	
P	Brunnera macrophylla	Siberian bugloss	H	H	H	?	?	?	
S	Buddleja alternifolia	fountain butterfly bush	L	L	M	/	M	M	
S	Buddleja davidii	butterfly bush	L	L	M	M	M	M	
S	Buddleja marrubiifolia	woolly butterfly bush	?	L	?	L	/	L	
P	Bulbine frutescens	stalked bulbine	L	?	L	L	/	L	
P	Bulbinella robusta	bulbinella	L	?	?	?	?	?	
T	Bursera hindsiana	bursera	?	?	/	/	/	M	
T	Butia capitata	pindo palm	L	L	L	L	L	L	
S	Buxus microphylla japonica	Japanese boxwood	M	M	M	M	M	M	
S	Buxus sempervirens	English boxwood	M	M	M	/	M	M	
S	Caesalpinea cacalaco	cascalote	?	?	?	?	/	L	
S	Caesalpinea gilliesii	desert bird of paradise	L	L	L	L	M	M	
S	Caesalpinea mexicana	Mexican bird of paradise	?	/	?	L	/	L	
S	Caesalpinea platyloba		?	?	?	?	?	?	
S	Caesalpinea pulcherrima	dwarf poinciana	L	L	M	M	/	M	
P	Calamagrostis spp.	feather reed	L	?	M	M	?	?	
P	Calamintha spp.	calamint	M	M	?	?	?	?	
P	Calceolaria spp.	slipper flower/slipperwort	M	/	M	?	?	?	
S	Calliandra californica	Baja fairy duster	/	/	VL	L	/	L	
S	Calliandra emarginata	dwarf powderpuff	?	?	?	?	?	?	
S	Calliandra eriophylla	fairy duster	/	/	VL	VL	/	L	
S	Calliandra haematocephala	pink powder puff	/	/	M	M	/	H	
S	Calliandra tweedii	trinidad flame bush	/	/	M	M	/	M	
S	Callicarpa bodinieri	beauty berry	M	M	?	?	?	?	
S	Callicarpa dichotoma	lavender beautyberry	M	M	M	?	?	?	
S	Callicarpa japonica	beauty berry	M	M	?	M	/	/	
T S	Callistemon citrinus	bottle brush	L	L	L	L	/	M	
T S	Callistemon pinifolius	pine-leafed bottlebrush	?	?	L	L	?	?	
T S	Callistemon salignus	pink tips/white bottlebrush	L	M	M	?	/	?	
T S	Callistemon speciosus	Albany bottlebrush	?	?	M	?	/	M	
T S	Callistemon subulatus	callistemon (subulatus)	?	?	L	?	?	?	
T S	Callistemon viminalis	weeping bottle brush	L	L	M	M	/	M	
S	Calluna vulgaris	Scotch heather	M	M	/	/	/	/	
T	Calocedrus decurrens	incense cedar	M	M	M	M	M	/	
S	Calocephalus brownii	cushion bush	L	/	L	L	/	L	
T	Calodendrum capense	cape chestnut	L	/	M	M	/	/	
S	Calostemma purpureum	garland lily	M	?	?	?	?	?	
S	Calothamnus quadrifidus	net bush	L	?	M	?	/	?	
S	Calycanthus floridus	Carolina allspice	M	?	?	?	?	?	
S	Calycanthus occidentalis	western spice bush	L	L	M	M	/	/	
P	Calyophus drummondii	calyophus (drummondii)	M	?	?	?	?	M	
Gc	Calyophus hartwegii	Sierra sundrop	L	?	?	?	?	M	
S	Camellia japonica	camellia	M	M	M	H	/	H	
S	Camellia sasanqua	sasanqua camellia	M	M	M	M	/	H	
P	Camissonia cherianthifolia (Oenothera)	beach evening primrose	L	?	L	/	/	/	
Gc	Campanula poscharskyana	Serbian bell flower	M	M	M	M	/	M	
P	Campanula spp.	bell flower	M	M	M	M	/	M	
V	Campsis spp.	trumpet creeper	L	L	M	M	M	M	
P	Canna spp.	canna	M	M	M	H	M	M	
S	Cantua buxifolia	magic flower	M	/	M	?	?	?	
S	Capparis spinosa	caper bush	L	/	L	?	?	?	
P	Carex (garden spp.)	sedge	M	M	M	M	/	M	
Gc	Carissa macrocarpa (prost.cvs.)	Natal plum	L	/	M	M	/	M	
S	Carissa spp.	Natal plum	L	/	M	M	/	M	
P	Carlina acaulis	stemless carline thistle	?	?	?	?	?	?	
S	Carnegiea gigantea	saguaro	/	/	VL	L	/	L	
S	Carpenteria californica	bush anemone	L	L	L	M	/	/	
T	Carpinus betulus 'Fastigiata'	European hornbeam	M	M	/	/	/	/	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
Gc	Carpobrotus spp.	ice plant (Carpobrotus)	L	M	VL	L	/	L	☹ ☹
T	Carya illinoensis	pecan	L	M	M	M	M	M	
S P	Caryopteris X clandonensis	blue mist	M	M	M	M	/	/	
S P	Caryopteris incana	common bluebeard	?	?	?	M	?	?	
T	Caryota mitis	clustered fishtail palm	/	/	M	/	/	/	
T S	Caryota urens	fishtail wine palm	H	/	M	H	/	/	
T	Casimiroa edulis	white sapote	M	/	M	M	/	/	
	Cassia australis (See Senna australis)								
	Cassia artemesioides (See Senna artemesioides)								
	Cassia bicapsularis (C. candolleana) See Senna bicapsularis								
	Cassia didymobotria (See Senna didymobotria)								
S	Cassia eremophila (C.nemophila)	desert cassia	/	?	L	L	L	L	
	Cassia goldmanii (See Senna polyantha)								
T	Cassia leptophylla	gold medallion tree	L	L	M	M	/	/	
	Cassia lindheimeriana (See Senna lindheimeriana)								
	Cassia odorata (See Senna odorata)								
	Cassia phyllodenia (See Senna phyllodenia)								
	Cassia spectabilis (C.excelsa)								
	Cassia splendida (See Senna splendida)								
	Cassia sturtii (See Senna sturtii)								
S	Cassia tomentosa (See Senna multiglandulosa)								
S	Cassia wizlizeni	shrubby cassia	?	?	L	?	/	L	
T	Castanopsis cuspidata	copper false chestnut	?	?	?	?	?	?	
T	Castanospermum australe	Moreton Bay chestnut	L	/	M	M	/	/	
T	Casuarina cunninghamiana	river she-oak	L	L	L	L	M	M	
	Casuarina stricta (See Allocasuarina verticilliata)								
T	Catalpa bungei	umbrella catalpa	L	?	?	?	?	?	
T	Catalpa speciosa	western catalpa	L	M	M	M	M	M	
P	Catananche caerulea	cupid's dart	M	L	M	?	?	?	
P	Catharanthus roseus	Madagascar periwinkle	M	M	M	M	M	M	
P	Cautleya spicata	cautleya	H	?	?	?	?	?	
S Gc	Ceanothus spp.	California lilac	VL	L	VL	L	L	/	
S Gc	Ceanothus cultivars	ceanothus	L	L	L	L	L	/	
T	Cedrus atlantica	Atlas cedar	M	M	L	M	M	M	
T	Cedrus deodora	deodar cedar	L	M	L	M	M	M	
T	Cedrus libani	cedar of Lebanon	M	M	L	M	?	?	
T	Celtis australis	European hackberry	L	M	/	/	M	M	
T	Celtis occidentalis	common hackberry	L	L	/	M	M	M	
T	Celtis reticulata	western hackberry	L	/	/	/	L	L	
T	Celtis sinensis	Chinese hackberry	L	M	/	M	M	M	
P	Centaurea cineraria	dusty miller (cineraria)	L	L	M	M	/	M	
P	Centaurea dealbata	Persian knapweed	M	?	M	?	?	?	
P	Centaurea gymnocarpa	velvet centaurea	L	L	M	M	/	M	
P	Centaurea montana	perennial cornflower	L	?	?	?	?	?	
P	Centaurea rupestris	centaurea (rupestris)	?	?	?	?	?	?	
P	Centranthus ruber	red valerian	VL	VL	L	L	/	M	☹
P	Centratherum punctatum	porcupine flower	?	?	M	?	?	?	
S	Cephalocereus spp.	old man cactus	VL	/	VL	L	L	L	
Gc	Cephalophyllum spp.	ice plant (Cephalophyllum)	L	L	L	L	/	L	
Gc	Cerastium tomentosum	snow in summer	M	M	M	M	M	M	
T	Ceratonia siliqua	carob	L	L	L	L	/	L	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
S	Ceratostigma abyssinicum	African plumbago	L	/	M	M	M	M	
S	Ceratostigma griffithii	Burmese plumbago	L	M	M	M	M	M	
Gc	Ceratostigma plumbaginoides	dwarf plumbago	L	M	M	M	M	M	
S	Ceratostigma willmottianum	Chinese plumbago	M	M	M	M	?	?	
T	Cercidiphyllum japonicum	Katsura tree	M	M	?	?	/	/	
T	Cercidium floridum (See Parkinsonia florida)								
T	Cercidium microphyllum	little leaf palo verde	/	VL	VL	L	/	L	
T	Cercidium praecox	Sonoran palo verde	/	L	VL	L	/	L	
T	Cercidium 'Sonorae'	Sonora cercidium	?	?	?	?	/	L	
T	Cercis canadensis	eastern redbud	M	M	M	M	/	/	
S	Cercis chinensis	Chinese redbud	M	M	?	?	?	?	
T S	Cercis mexicana	Mexican redbud	L	L	?	?	?	?	
T S	Cercis occidentalis	western redbud	VL	VL	L	L	/	/	
T	Cercis reniformis	southwest redbud	L	L	?	?	?	?	
T S	Cercis siliquastrum	Judas tree	M	M	?	?	?		
S	Cercocarpus betuloides	mountain ironwood	VL	VL	VL	VL	VL	/	
S	Cercocarpus minutiflorus	San Diego mountain mahogany	L	?	VL	VL	/	/	
S	Cereus peruvianus	Peruvian apple cactus	/	?	L	L	/	L	
S V	Cestrum auranticum	orange cestrum	M	/	M	M	?	?	
S	Cestrum elegans	red cestrum	M	/	M	M	/	M	
S	Cestrum fasciculatum var. 'Newellii	Newell cestrum	M	?	M	?	?	?	
S	Cestrum nocturnum	night jessamine	M	M	M	M	/	M	
S	Chaenomeles cvs.	flowering quince	L	L	M	M	L	M	
P	Chaenorhinium glareosum	dwarf snapdragon	M	?	?	?	?	?	
T S	Chamaecyparis spp.	false cypress	M	M	/	/	/	/	
S P	Chamaedorea spp.	chamaedorea	/	/	H	H	/	H	
Gc P	Chamaemelum nobile	chamomile	L	M	M	M	M	M	
T S	Chamaerops humilis	Mediterranean fan palm	L	L	M	M	M	M	
S	Chamelaucium uncinatum	Geraldton wax flower	L	L	L	M	/	M	
P	Chasmanthe aethiopica	chasmanthe	L	?	L	L	?	?	
P	Chasmanthium latifolium	sea oats	L	M	M	M	M	M	
P	Cheilanthes lanosa	hairy lip fern	M	?	?	?	?	?	
P	Cheiranthus cheiri (See Erysimum cheiri)								
T	Chilopsis linearis	desert willow	VL	VL	VL	L	M	M	
S	Chimonanthus praecox	wintersweet	?	?	M	?	?	?	
S	Chimonobambusa marmorea (Arundinarea)	marbled bamboo	L	L	M	M	/	M	
T	Chimonobambusa quadrangularis	square-stemmed bamboo	L	L	M	M	/	M	
T	Chionanthus retusus	Chinese fringe tree	M	M	M	M	/	/	
T	Chionanthus virginicus	white fringe tree	M	/	?	?	?	?	
T	X Chitalpa tashkentensis	chitalpa	L	M	L	L	L	M	
S	Choisya ternata	Mexican orange	M	M	M	M	/	M	
P	Chondropetalum tectorum	cape reed	H	?	M	?	?	?	
T	Chorisia insignis	white floss silk tree	M	/	M	L	/	M	
T	Chorisia speciosa	floss silk tree	L	/	L	L	/	M	
S	Chorizema cordata	flame pea	M	?	?	?	?	?	
	Chrysanthemum frutescens (See Argyranthemum frutescens)								
	Chrysanthemum maximum (See Leucanthemum X superbum)								
	Chrysanthemum parthenium (See Tanacetum parthenium)								
P	Chrysopsis villosa (See Heterotheca villosa)								
S	Chrysothamnus nauseosus albicaulis	rabbit brush	/	/	?	?	VL	?	
P	Chusquea coronalis	bamboo	H	?	M	H	?	?	
P	Cibotium glaucum	Hawaiian tree fern	/	/	H	H	/	/	
T	Cinnamomum camphora	camphor tree	M	/	M	M	/	M	
V	Cissus antarctica	kangaroo treebine	L	M	M	M	/	M	

			REGIONAL EVALUATIONS						
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V	Cissus rhombifolia	grape ivy	M	/	M	M	/	M	
V	Cissus trifoliata	treebine	?	/	?	?	?	L	
S Gc	Cistus spp.	rockrose	L	L	L	L	L	L	☹
T S	Citrus spp.	orange, lemon etc.	M	M	M	M	/	M	
V	Clematis armandii	evergreen clematis	M	M	M	M	M	M	
V	Clematis hybrids and cvs	deciduous clematis	M	M	H	H	M	M	
S	Clematis integrifolia	bushy clematis	M	M	?	?	?	?	
V	Clematis lasiantha	pipestem clematis	L	L	VL	L	/	/	
V	Clematis ligusticifolia	western virgin's bower	M	?	?	L	/	/	
V	Clematis pauciflora	small flowered clematis	?	?	VL	L	?	?	
S	Cleome isomeris	bladder pod	VL	VL	VL	VL	L	L	
P	Clerodendrum bungei	cashmere bouquet	L	M	M	?	?	?	
T S	Clerodendrum trichotomun	harlequin glory bower	M	?	?	?	?	?	
S	Clerodendrum ugandense	butterfly bush	M	?	M	M	/	M	
T S	Clethra alnifolia	summersweet	M	/	?	?	?	?	
S	Cleyera japonica	sakaki	M	M	M	?	?	?	
S	Clianthus puniceus	parrot's beak	L	L	M	M	?	?	
P	Clivia miniata	Kaffir lily	M	M	L	M	/	M	
V	Clytostoma callistigioides	violet trumpet vine	M	M	M	M	/	M	
S	Cneoridium dumosum	bushrue	?	?	?	?	L	L	
V	Cobaea scandens	cup and saucer vine	M	M	?	?	?	?	
T S	Cocculus laurifolius	laurel leaf cocculus	M	M	M	M	/	M	
P	Colchicum agrippium	autumn crocus	VL	VL	M	M	M	M	
S	Coleonema album	white breath of heaven	M	M	M	M	/	/	
S	Coleonema pulchrum	breath of heaven	M	M	M	M	/	/	
S T	Comarostaphylis diversifolia (See Archtostaphylos diversifolia)								
V	Combretum fruticosum	combretum	/	/	M	M	/	/	
S	Convolvulus cneorum	bush morning glory	L	L	L	L	L	L	
	Convolvulus mauritanicus (see C. Sasbatius)								
Gc P	Convolvulus sabatius	ground morning glory	L	L	L	L	M	M	
S Gc	Coprosma X kirkii	creeping coprosma	L	L	M	M	/	/	
	Coprosma pumila (See C.petriei)							/	
S Gc	Coprosma petriei 'Verde vista'	verde vista coprosma	L	L	M	M	/	/	
S	Coprosma repens	mirror plant	M	M	M	M	/	/	☹
T S	Cordia boissieri	Texas olive	?	?	?	L	L	L	
S	Cordia parvifolia	little leaf cordia	?	?	L	L	/	L	
T	Cordyline australis	New Zealand cabbage tree	L	M	L	M	M	M	☹
T S	Cordyline indivisa	blue dracaena palm	L	L	?	?	?	?	
S	Cordyline stricta	palm lily	/	M	M	M	/	M	
S	Cordyline terminalis	ti plant	M	/	M	/	/	/	
P	Coreopsis auriculata'Nana'	dwarf coreopsis	L	L	L	L	M	M	
P	Coreopsis gigantea	giant coreopsis	?	?	VL	L	/	/	
P	Coreopsis lanceolata	coreopsis	L	L	L	L	M	M	
P	Coreopsis maritima	sea dahlia	L	?	VL	?	?	?	
P	Coreopsis verticilata cvs.	threadleaf coreopsis	L	L	L	L	M	M	
P	Corethrogyne californica	black bush	?	?	/	/	VL	/	
T	Cornus alba	red-barked dogwood	M	M	?	?	/	/	
Gc	Cornus canadensis	bunchberry	M	M	?	?	/	/	
T	Cornus capitata	evergreen dogwood	M	M	M	?	/	/	
T	Cornus 'Eddie's White Wonder'	Eddie's white wonder dogwood	M	M	?	?	/	/	
T	Cornus kousa	Japanese dogwood	M	M	/	/	/	/	
T	Cornus kousa chinensis	Chinese dogwood	M	M	/	/	/	/	
T	Cornus florida	eastern dogwood	M	M	H	H	/	/	
T	Cornus nuttallii	western dogwood	M	M	/	M	/	/	
	Cornus sericea (See C. stolonifera)								
S	Cornus stolonifera	red osier dogwood	H	H	/	H	/	/	
S	Corokia cotoneaster	wire-netting bush	M	M	M	M	M	M	
S	Corokia X virgata	corokia	M	?	M	?	?	?	
S	Correa spp.	Australian fuchsia	L	L	L	L	/	M	

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S	Cortaderia sellowana cvs.	pampas grass	VL	L	L	L	L	L	☹ ☹
S T	Corylopsis spicata	winter hazel	M	?	?	?	/	/	
S	Corylus avelleana contorta	Harry Lauder's walking stick	M	M	/	/	/	/	
S	Corylus cornuta californica	western hazelnut	L	?	/	/	/	/	
T S	Corylus maxima	filbert	L	/	/	/	/	/	
T	Corynocarpus laevigata	New Zealand laurel	M	/	H	/	/	/	
P	Cosmos atrosanguineus	chocolate cosmos	M	M	M	?	?	?	
T S	Cotinus coggygria	smoke tree	L	L	L	L	L	/	
T S	Cotinus obvatus	American smoke tree	L	?	?	?	?	?	
S	Cotoneaster spp. (shrubs)	cotoneaster	L	L	L	M	M	M	☹ ☹
Gc	Cotoneaster spp.(ground covers)	cotoneaster	M	M	M	M	M	M	
P	Cotula lineariloba	silver button plant	H	H	M	?	?	?	
P	Cotula 'Silver Mound'	cotula	H	H	?	?	?	?	
S P	Cotyledon spp.	cotyledon	L	L	L	L	/	L	
S	Coursetia axillaris	baby bonnets	?	?	?	?	?	L	
S	Cowania mexicana	cliff rose	L	/	/	L	L	L	
S P	Crassula spp.	crassula	L	L	L	L	/	L	
P	Craspedia globosa	drumsticks	M	M	M	M	?	?	
T	Crataegus spp.	hawthorn	M	M	/	M	M	/	☹
T	Crinodendron hookerianum	lantern tree	?	?	?	?	?	?	
T	Crinodendron patagua	lily-of-the-valley tree	M	/	M	M	/	/	
P	Crinum spp.	crinum lily, spider lily	M	M	M	M	?	M	
P	Crocrosmia hybrids (Tritonia)	montbrieta	L	L	L	L	/	L	
S	Crotalaria agatiflora	canary-bird bush	L	/	M	M	/	H	
T S	Cryptomeria japonica	Japanese cryptomeria	M	H	H	H	/	/	
T	Cupaniopsis anacardioides	carrotwood	M	/	M	M	/	/	
P	Cuphea hyssophyla	false heather	M	M	M	M	/	/	
P	Cuphea ignea	cigar plant	M	M	M	M	/	/	
P Gc	Cuphea llavea	bat-faced cuphea	M	?	?	?	/	/	
S P	Cuphea micropetela	cuphea (micropetala)	?	?	M	?	/	/	
T	X Cupressocyparis leylandii	Leyland cypress	M	M	M	/	M	M	
T	Cupressus arizonica ssp. arizonica	Cuayamaca cypress	VL	VL	VL	L	L	L	
T	Cupressus arizonica var.glabra	smooth Arizona cypress	VL	VL	VL	L	L	L	
T	Cupressus goveniana	Gowen cypress	?	?	?	?	?	?	
T	Cupressus guadalupensis forbesii	tecate cypress	L	L	VL	VL	/	/	
T	Cupressus macrocarpa	Monterey cypress	M	M	M	/	/	/	☹
T	Cupressus sempervirens	Italian cypress	L	M	L	L	M	M	
T	Cussonia paniculata	little cabbage tree	/	/	M	?	/		
S P	Cyathea cooperii	Australian tree fern	H	H	H	H	/	/	
S	Cycas revoluta	sago palm	M	M	M	M	M	M	
P	Cyclamen hederifolium	cyclamen	L	L	M	?	/	M	
P	Cyclamen persicum hybrids	florists' cyclamen	M	M	M	M	/	M	
Gc P	Cymbalaria muralis	Kenilworth ivy	M	M	H	H	/	/	
P	Cyperus albostriatus	dwarf umbrella plant							
P	Cyperis spp.	umbrella sedge/papyrus	H	H	H	H	H	H	
P	Cyrtanthus brachyscyphus	dobo lily	M	?	?	?	?	?	
P	Cyrtanthus purpureus	fire lily	M	?	?	?	?	?	
P	Cyrtomium falcatum	holly fern	M	M	H	M	/	M	
Gc	Cytisus X kewensis	Kew broom	M	M	/	/	M	/	
S	Cytisus spp.	broom (Cytisus)	L	L	/	M	/	/	☹ ☹
S	Daboecia cantabrica	Irish heath	M	?	?	?	/	/	
S	Dahlia imperialis	tree dahlia	M	M	M	M	/	?	
P	Dahlia spp.	dahlia	M	M	M	H	H	H	
T	Dalbergia sissoo	sissoo	/	/	/	/	/	M	
S	Dalea bicolor	dalea (bicolor)	/	/	L	L	/	M	
Gc	Dalea capitata	dalea (capitata)	/	/	?	?	M	M	
S	Dalea dorychnioides	dalea (dorychnioides)	?	?	?	?	?	?	
S	Dalea frutescens	black dalea	/	/	M	/	M	M	
P	Dalea gattingeri (Petalostemum purpureum)	purple prairie clover	?	?	?	?	?	?	
Gc	Dalea greggii	trailing indigo bush	?	/	L	L	L	L	

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S	Dalea lutea	dalea (lutea)	/	/	/	?	M	M	
Gc	Dalea orcutii	Baja indigo bush	/	/	L	L	/	L	
S	Dalea pulchra	indigo/pea bush	/	/	M	/	M	M	
T	Dalea spinosa (See Psorothamnus spinosa)								
S	Dalea versicolor	dalea (versicolor)	/	/	M	/	M	M	
P	Dalechampia dioscorifolia	purple wings	?	?	M	?	?	?	
S Gc	Dampiera diversifolia	dampiera	L	/	M	?	?	?	
P	Dampiera trigona	dampiera	L	/	M	?	?	?	
S	Daphne X burkwoodii	Burkwood daphne	M	M	?	?	?	?	
S	Daphne caucasica	daphne (caucasia)	M	?	M	?	?	?	
S	Daphne odora	winter daphne	M	M	M	M	/	/	
P	Darmera peltata	umbrella plant/Indian rhubarb	H	?	?	?	?	?	
S	Dasylirion spp.	desert spoon	VL	/	L	L	L	L	
P	Davallia trichomanoides	squirrel's foot fern	L	M	M	H	/	H	
Gc	Delosperma spp.	ice plant (Delosperma)	L	M	L	L	/	L	☹
P	Delphinium spp.	delphinium	M	M	M	M	M	M	
T S	Dendriopoterium menendezii	dendriopoterium	?	?	M	?	/	?	
S	Dendromecon spp.	bush poppy	VL	L	VL	L	/	/	
P	Deschampsia caespitosa	tufted hairgrass	L	L	L	L	/	/	
S	Deutzia spp.	bridal wreath	M	M	/	M	M	/	
P	Dianella intermedia	Turutu	M	?	M	?	?	?	
P	Dianella tasmanica	blueberry	M	?	M	M	/	?	
P	Dianthus spp.	pink/carnation	M	M	M	M	M	M	
P	Diascia spp.	twinspur	M	M	M	M	/	/	
P	Dicentra spp.	bleeding heart	M	M	M	H	/	/	
P	Dichelostemma capitatum	wild hyacinth	L	L	M	?	?	?	
Gc	Dichondra argenta	silver dichondra	?	?	M	?	?	?	
Gc	Dichondra micrantha	dichondra	M	M	M	H	/	H	
P	Dichorisandra thyrsifolia	blue ginger	/	/	H	?	/	?	
P	Dichroa febrifuga	evergreen hydrangea	?	?	M	?	?	?	
S P	Dicksonia antarctica	Tasmanian tree fern	H	H	H	H	/	/	
P	Dicliptera suberecta	velvet honeysuckle	L	?	M	?	?	M	
P	Dictamnus spp.	burning bush/dittany	L	L	?	?	?	?	
P	Dierama spp.	fairy wand	M	M	M	?	?	?	
P	Dietes bicolor	fortnight lily	L	L	M	M	/	M	
P	Dietes iridioides	fortnight lily	L	L	M	M	/	M	
P	Dietes vegeta (See D. iridioides)								
P	Digitalis lutea	hardy/straw foxglove	M	M	?	?	?	?	
P	Digitalis X mertonensis	foxglove	M	M	M	M	M	M	
S	Dioon spp.	Mexican cycad	/	/	M	M	M	M	
T	Diospyros kaki	Japanese persimmon	L	M	M	M	M	M	
	Diplacus (see Mimulus)								
V	Dipogon lignosus	Australian pea	H	?	?	?	?	?	
V	Distictis buccinatoria	blood red trumpet vine	M	M	M	M	/	M	
V	Distictis 'Rivers'	royal trumpet vine	M	M	M	M	/	M	
	Disygotheca elegantissima (see Schlefflera elegantissima)								
Gc	Dodonaea procumbens	hopseed bush (procumbens)	L	L	L	?	?	?	
S	Dodonaea viscosa	hopseed bush	L	L	L	M	/	M	
S	Dodonaea viscosa 'Purpurea'	purple hopseed bush	L	L	L	M	/	M	
V	Dolichos labab	see Labab purpureus							
T S	Dombeya spp.	dombeya	/	/	M	M	/	/	
T	Dombeya cacuminum	strawberry snowball	/	/	M	M	/	/	
P	Doronicum orientale (D. caucasium)	leopard's bane	M	?	M	?	?	?	
S	Doryanthes palmeri	spear lily	L	/	L	L	/	/	
S	Dorycnium hirsutum	hairy canary clover	/	?	L	?	?	?	
T	Dracaena draco	dragon tree	L	/	VL	L	/	/	
S	Drepanostachyum falcatum (Arundinaria)	blue bamboo	L	L	M	M	/	M	
S	Drepanostachyum hookerianum	bamboo	L	L	M	M	/	M	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
T	Drimys lanceolata	pepper tree	M	?	?	?	?	?	
T	Drimys winteri	winter's bark	M	?	?	?	?	?	
Gc	Drosanthemum spp.	ice plant (Drosanthemum)	L	L	L	L	/	L	
P	Dryopteris arguta	sheild/wood fern	M	?	M	?	?	?	
P	Dryopteris dilatata	broad buckler fern	M	?	M	?	?	?	
P	Dryopteris erythrosora	wood fern	M	M	M	M	/	/	
P	Dryopteris felix-mas	male fern	M	?	?	?	?	?	
Gc	Duchesnea indica	Indian mock strawberry	M	M	M	M	/	M	☹
P	Dudleya spp.	dudleya, live forever	L	L	VL	L	L	L	
S	Duranta erecta (D. repens)	sky flower	/	/	M	M	/	M	
S	Duranta stenostachya	Brazilian sky flower	/	/	M	M	/	/	
P	Dyckia spp.	dyckia	L	?	L	L	?	?	
P Gc	Dymondia margaretae	dymondia	L	L	L	L	/	/	
	Dyssodia acerosa	shrubby dogweed	?	?	?	?	?	L	
P	Dyssodia pentachaeta	golden fleece	?	M	?	?	M	M	
S P	Echeveria spp.	hens and chickens	L	L	L	L	/	M	
P	Echinacea spp.	cone flower	M	M	M	M	M	M	
S	Echinocactus spp.	barrel cactus	VL	VL	L	L	/	L	
	Note: Many Echinocactus spp. are now in other genera including Ferrocactus, Echinopsis, Parodia, Sclerocactus and others								
P	Echinops exaltus	globe thistle	M	M	M	?	?	M	
P	Echinopsis spp. (Trichocereus spp.)	torch cactus	L	L	L	L	L	L	
S P	Echium candicans (fastuosum)	pride of Madeira	L	L	L	L	/	M	☹
S P	Echium pininana	pride of Teneriffe	L	L	?	?	?	?	
Bi	Echium 'Purple Tower'	purple tower echium	L	L	?	?	?	?	
Bi	Echium wildpretii	tower of jewels	L	L	M	M	/	/	
S	Edraianthus graminifolius	grassy bells	L	L	?	?	?	?	
T S	Elaeagnus angustifolia	Russian olive	L	L	L	L	M	M	☹
S	Eleagnus X ebbengei	Ebbinge's silverberry	L	L	?	?	M	M	
S	Elaeagnus pungens	silverberry	L	L	L	L	L	L	
T	Elaeocarpus decipiens	Japanese blueberry tree	M	?	M	?	?	?	
P	Elymus spp. (also see Leymus spp.)	wild rye	L	L	L	L	M	M	
P	Encelia californica	California encelia	/	/	VL	L	/	L	
S	Encelia farinosa	brittle bush	/	/	VL	L	L	L	
S	Enkianthus campanulatus	red-veined enkianthus	M	H	?	?	?	/	
S P	Ensete ventricosum	Abyssinian banana	H	H	H	H	/	H	
S	Epacris gunii	Australian heath	M	?	?	?	?	?	
P	Epidendrum reed stem hybrids	epidendrum	M	/	M	M	?	?	
P	Epilobium spp.(Zauchneria)	California fuchsia	L	L	VL	L	M	M	
Gc	Epimedium grandiflorum	bishop's hat	M	M	/	/	/	/	
P	Equisetum spp.	horsetail	H	H	H	H	H	H	
S	Eremophila glabra	emu bush	L	L	L	?	/	L	
S	Eremophila maculata	spotted emu bush	L	L	L	L	/	L	
S	Eremophila racemosa	Easter egg bush	?	?	L	L	?	?	
P	Erianthus ravennae	plume grass	?	?	?	?	?	?	
S Gc	Erica spp.	heath	M	M	M	/	/	/	☹
S	Ericameria laricifolia (Haplopappus)	turpentine bush	/	/	/	/	L	L	
P	Erigeron divergens	native fleabane	?	?	?	?	?	?	
P	Erigeron formosissimus	fleabane	M	?	?	?	?	?	
P	Erigeron glaucus	beach aster	L	/	M	M	/	/	
P	Erigeron karvinskianus	fleabane	L	M	M	M	M	M	
P	Erigeron speciosus	Oregon fleabane	?	?	?	?	?	?	
S P	Eriogonum spp.	buckwheat	L	L	VL	L	L	L	
P	Eriophyllum confertiflorum	golden yarrow	L	?	VL	VL	/	/	
P	Eriophyllum lanatum	chalk buckwheat	L	?	?	?	?	?	
	Erodium chaemedryoides (See E. reichardii)								
P Gc	Erodium chrysanthum	cranessbill (chrysanthum)	L	M	M	M	M	M	
P	Erodium corsicum	heron's-bill	?	?	?	?	?	?	

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P	Erodium reichardii	alpine geranium	L	M	M	M	M	M	
P	Eryngium pandanifolium	sea holly	M	?	?	?	?	?	
P	Eryngium variifolium	sea holly	M	?	?	?	?	?	
T	Eryobotrya deflexa	bronze loquat	M	M	M	M	/	M	
T	Eryobotrya japonica	loquat	L	L	M	M	/	M	
P	Erysimum 'Bowles Mauve'	Bowles mauve wallflower	L	L	M	M	?	?	
P	Erysimum cheiri (Cherianthus cheiri)	wallflower	M	M	M	M	M	M	
P	Erysimum helveticum	wallflower	M	?	?	?	?	?	
P	Erysimum hyeraciifolium	Siberian wallflower	L	L	L	?	?	?	
P	Erysimum 'Jubilee'	jubilee wallflower	L	L	L	?	?	?	
P	Erysimum linifolium	wallflower	L	L	L	M	/	M	
P	Erysimum menziesii	wallflower	L	L	L	?	?	?	
P	Erysimum pulchellum	wallflower	L	L	L	?	?	?	
P	Erysimum suffrutescens (concinnum)	Pt. Reyes wallflower	L	L	?	?	?	?	
P	Erysimum 'Wenlock Beauty'	Wenlock beauty wallflower	?	?	L	?	?	?	
T	Erythrina americana(E.coralloides)	naked coral tree	/	/	L	L	/	/	
T	Erythryna X bidwillii	coral tree	L	L	L	L	/	/	
T	Erythrina caffra	Kaffir bloom coral tree	/	/	L	L	/	/	
T S	Erythrina crista-galli	cockspur coral tree	M	M	L	L	/	M	
T	Erythrina falcata	coral tree (falcata)	/	/	L	/	/	/	
T	Erythrina humeana	Natal coral tree	/	M	L	M	/	/	
T	Erythrina X sykesii	Sykes coral tree	/	/	L	L	/	/	
S	Escallonia spp.	escallonia	M	M	M	M	/	M	
P	Eschscholzia californica	California poppy	VL	VL	L	L	L	L	
S	Espostoa lantana	Peruvian old man cactus	?	?	L	L	L	L	
T	Eucalyptus camaldulensis	red gum	L	L	L	L	M	M	☹
T	Eucalyptus campaspe	silver gimlet	?	L	M	?	/	M	
T	Eucalyptus cinerea	ash leaved gum, silver dollar tree	VL	L	L	M	?	?	
T	Eucalyptus citriodora	lemon scented gum	L	/	L	M	/	M	
T	Eucalyptus cladocalyx	sugar gum	L	/	L	L	/	/	
T	Eucalyptus deglupta	mindinao gum	/	/	M	M	/	/	
T	Eucalyptus erythrocorys	red cap gum	L	L	M	M	/	M	
T	Eucalyptus ficifolia	red flowering gum	L	/	M	M	/	/	
T	Eucalyptus formanii	Forman's mallee	?	?	L	?	?	L	
T	Eucalyptus globulus	blue gum	L	L	L	M	/	/	☹ ☹
	Eucalyptus grandis	flooded/rose gum	M	M	M	M	/	/	
T	Eucalyptus gunnii	cider gum	L	L	L	L	?	?	
T	Eucalyptus kruseana	book-leaf mallee	VL	/	L	?	/	?	
T	Eucalyptus largiflorens	black box	?	?	?	?	?	?	
T	Eucalyptus lehmannii	bushy yate	L	L	L	L	/	/	
T	Eucalyptus leucoxylon	white ironbark	L	L	L	L	/	M	
T	Eucalyptus loxophleba	York gum	?	VL	?	VL	/	/	
T	Eucalyptus macranda	long flowered marlock	VL	VL	VL	L	/	L	
T	Eucalyptus maculata	spotted gum	L	/	M	M	/	/	
T	Eucalyptus microtheca	coolibah	L	L	L	L	M	M	
T	Eucalyptus nicholii	Nichol's willow leaf peppermint	L	L	M	M	M	M	
T	Eucalyptus polyanthemos	silver dollar gum	L	L	L	L	M	M	
T	Eucalyptus preissiana	bell mallee	VL	/	L	?	/	?	
T	Eucalyptus pulverulenta	silver mountain gum	L	M	M	M	/	M	☹
T	Eucalyptus robusta	swamp mahogany	L	L	L	L	/	/	
T	Eucalyptus rudis	flooded gum	L	L	L	L	M	M	
T	Eucalyptus sargentii	Salt River mallet	?	VL	?	L	/	L	
T	Eucalyptus sideroxylon	red iron bark	L	L	L	L	M	M	
T	Eucalyptus spathulata	swamp mallee	L	/	L	L	/	M	
T	Eucalyptus torelliana	cadaga	/	/	?	?	?	?	
T	Eucalyptus torquata	coral gum	L	L	L	M	/	M	
T	Eucalyptus viminalis	manna gum	L	L	L	M	/	M	
T	Eucalyptus woodwardii	lemon flowered gum	VL	?	L	?	?	L	
P	Eucomis bicolor hybrids	pineapple lily	M	?	?	?	?	?	
T	Eucryphia glutinosa	hardy eucryphia	M	?	?	?	?	?	

			REGIONAL EVALUATIONS						
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T	Eucryphia x intermedia	eucryphia	M	M	?	?	?	?	
T	Eucryphia lucida (billardieri)	leatherwood	M	M	?	?	?	?	
S	Euonymous alatus	burning bush	M	M	?	?	?	?	
Gc	Euonymus fortunei	purple winter creeper	M	M	M	M	M	/	
V	Euonymus fortunei radicans	winter creeper	M	M	/	M	M	M	
S	Euonymus japonicus	evergreen euonymus	L	L	M	M	M	M	
S	Euonymus kiautschovicus	euonymus	L	?	?	?	?	?	
P	Eupatorium spp.	mistflower	M	?	M	?	M	M	
P	Euphorbia characias	euphorbia	L	L	L	L	?	?	
T S	Euphorbia cotinifolia	Carribean copper plant	/	/	M	/	/	/	
P	Euphorbia cyparissias	cypress spurge	L	?	?	?	?	?	
P	Euphorbia dulsis	euphorbia (dulsis)	M	?	?	?	?	?	
S	Euphorbia lambii	tree euphorbia	?	?	?	?	?	?	
S	Euphorbia milii	crown of thorns	/	L	L	L	/	L	
P	Euphorbia myrsinites	euphorbia	L	?	L	L	?	?	
P	Euphorbia polychroma (epithymoides)	cushion spurge	L	L	?	?	?	?	
S	Euphorbia pulcherrima	poinsettia	/	/	L	M	/	M	
S	Euphorbia rigida	euphorbia	/	L	VL	L	/	L	
P	Euphorbia segueriana niciciana	euphorbia	?	?	?	?	?	?	
S	Euphorbia tirucalli	milk bush	/	/	VL	/	/	L	
S P	Euryops pectinatus	euryops/shrub daisy	L	L	L	L	M	M	
S P	Euryops pectinatus viridis	green euryops	M	M	M	M	M	M	
P	Evolvulus pilosus (nuttallianus)	evolvulus	?	?	M	M	/	?	
S	Fabiana imbricana	pichi	?	?	M	?	?	?	
T	Fagus sylvatica	European beech	M	H	/	/	/	/	
P	Fallopia japonica	Japanese knotweed	?	?	?	?	?	?	
S	Fallugia paradoxa	Apache plume	/	?	VL	VL	L	L	
P	Farfugium japonicum (Ligularia)	farfugium/ligularia	H	H	H	?	?	?	
	Fargesia murielae	see Thamnocalamus spathaceus							
S P	Fargesia nitida (See Sinarundinaria nitida)								
P	Fascicularia pitcairnifolia	fascicularia	?	?	L	?	?	?	
V	X Fatshedera lizei	tree ivy	M	M	M	H	/	H	
S	Fatsia japonica	Japanese aralia	M	M	M	M	/	H	
	Feijoa sellowiana (See Acca sellowiana)								
S	Felicia amelloides	blue marguerite	M	M	M	M	/	M	
S	Felicia fruticosa	shrub aster	L	L	L	M	/	M	
S	Ferocactus spp.	barrel cactus	VL	VL	VL	L	L	L	
P	Festuca californica	California fescue	L	M	M	M	M	M	
P	Festuca cinerea	fescue (cinerea)	L	?	M	?	?	?	
P	Festuca idahoensis	Idaho fescue	VL	L	?	?	?	?	
P	Festuca muelleri	Mueller's fescue	?	?	M	M	?	?	
P	Festuca glauca	blue fescue	L	L	M	M	M	M	
P Gc	Festuca rubra	creeping red fescue	L	/	H	H	/	/	
P	Festuca tenuifolia	fescue (tenuifolia)	M	?	?	?	?	?	
T	Ficus auriculata	Roxburgh fig	/	/	M	M	/	/	
T	Ficus barteri	banana-leaf fig	?	?	?	?	?	?	
T S	Ficus benjamina	weeping Chinese banyan	/	/	M	/	/	M	
T	Ficus carica	edible fig	M	M	M	M	M	M	☹
T S	Ficus elastica	rubber plant	/	/	M	M	/	/	
T	Ficus florida	Florida fig	/	/	M	M	/	/	
T	Ficus macrophylla	Moreton Bay fig	/	/	M	M	/	/	
T	Ficus microcarpa	Indian laurel fig/ laurel fig	M	/	M	M	/	M	
T	Ficus microcarpa 'Green Gem"	green gem ficus	M	/	L	M	/	M	
T	Ficus microphylla (See Ficus rubiginosa)								
V	Ficus pumila	creeping fig	M	M	M	M	M	M	
T	Ficus retusa nitida (See Ficus microcarpa)								

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T	Ficus rubiginosa	rusty leaf fig	M	/	M	M	/	/	
	Filipendula hexapetela	see Filipendula vulgaris							
P	Filipendula vulgaris	Meadowsweet	H	?	?	?	?	?	
S	Forestiera neomexicana	desert olive	?	?	L	L	L	L	
S	Forsythia X intermedia	forsythia	L	L	M	M	M	M	
S	Fothergilla gardenii	dwarf fothergilla	M	M	?	?	?	?	
S	Fouquieria splendens	ocotillo	/	/	VL	L	L	L	
Gc	Fragaria spp.	strawberry	M	M	M	M	M	M	
P	Francoa ramosa	bridal wreath	M	M	M	M	/	/	
P	Francoa sonchifolia	bridal wreath	M	?	M	?	/	/	
T S	Franklinia alatamaha (Gordonia altmahama) franklin tree	franklin tree	M	/	/	/	/	/	
T	Fraxinus americana	white ash	M	M	/	/	/	/	
T	Fraxinus griffithi	Griffith ash	?	?	?	?	?	?	
T	Fraxinus latifolia	Oregon ash	M	M	/	/	/	/	
T	Fraxinus 'Moraine'	moraine ash	M	M	/	/	M	M	
T	Fraxinus oxycarpa 'Raywood'	raywood ash	M	M	M	M	M	/	
T	Fraxinus pennsylvanica'Marshal'	green ash	M	M	/	/	M	/	
T	Fraxinus uhdei	evergreen ash	M	M	M	M	H	H	
T	Fraxinus velutina	Arizona ash	M	M	M	M	M	M	
T	Fraxinus velutina 'Modesto'	Modesto ash	M	M	M	M	M	M	
S	Fremontodendron spp.	flannel bush	VL	VL	VL	L	/	/	
P	Fuchsia spp.	fuchsia	M	M	H	H	/	/	
S	Furcraea spp.	furcraea	L	/	/	L	L	?	
P	Gaillardia grandiflora	blanket flower	L	L	M	M	M	M	
P	Galium odoratum	sweet woodruff	M	M	H	/	/	/	
P	Galtonia candicans	summer hyacinth	?	?	?	?	?	?	
S	Galvesia juncea	Baja bush-snapdragon	/	/	VL	L	/	M	
S	Galvesia speciosa	island bush snapdragon	L	L	VL	L	?	M	
S	Gamolepis chrysanthemumoides	gamolepis	M	M	M	M	/	H	
S	Gardenia spp.	gardenia	M	M	M	M	/	M	
S	Garrya eliptica	coast silktassel	L	L	L	M	/	/	
S	Garrya flavescens	ashy silktassel	/	?	L	L	/	/	
S	Garrya fremontii	Fremont silktassel	L	L	VL	/	/	/	
P	Gasteria spp.	mother-in-law's tongue etc.	L	L	L	L	/	?	
S	Gaultheria mucronata (Pernettya mucronata)	prickly heath	M	?	?	?	?	?	
Gc	Gaultheria procumbens	creeping wintergreen	M	M	/	/	/	/	
S	Gaultheria shallon	salal	M	M	/	H	/	/	
P	Gaura lindheimeri	gaura	M	M	M	M	M	M	
Gc	Gazania spp.	gazania	M	M	M	M	M	M	
T	Geijera parviflora	Australian willow	M	M	L	M	M	M	
V	Gelsemium rankinii	swamp jessamine	?	?	?	?	?	?	
V	Gelsemium sempervirens	Carolina jessamine	L	L	M	M	/	M	
Gc	Genista lydia	Lydia woadwaxen	M	?	M	?	/	/	
Gc	Genista pilosa (Vancouver Gold)	Vancouver gold genista	M	M	/	M	?	M	
S	Genista spp.	broom (Genista)	L	L	M	M	/	M	☹ ☹
P	Gentiana scabra procumbens	gentian	H	?	?	?	?	?	
P	Geranium spp.	cranesbill	M	M	M	M	M	M	
P	Gerbera jamesonii	Transvaal daisy	M	M	M	M	/	M	
P	Geum spp.	avens	M	M	M	M	M	/	
T	Ginkgo biloba	maiden hair tree	M	M	M	M	M	?	
P	Gladiolus spp.	gladiolus	L	L	L	L	/	/	
P	Gladiolus hybrids & selections	gladiolus	M	M	M	M	/	/	
P Gc	Glechoma hederaceae	ground ivy	L	M	M	H	/	/	
T	Gleditsia triacanthos	honey locust	L	L	M	L	L	L	
P	Globularia cordifolia	creeping globe daisy	L	?	?	?	?	?	
P	Globularia X indubia	globe daisy	M	?	?	?	?	?	
P	Goniolimon incanum (Limonium speciosum)	statice	L	L	L	M	/	M	

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P	Goniolimon tataricum (Limonum tataricum)	Tartarian statice	L	?	M	?	?	?	
T	Gordonia axillaris	gordonia	H	?	?	?	?	?	
T	Gordonia lasianthus	lob lolly bay	M	?	H	?	?	?	
S	Graptopetalum spp.	graptopetalum	VL	L	L	L	/	M	
S	Grevillea spp.	grevillea	L	L	L	L	/	M	
T	Grevillea robusta	silk oak	L	L	L	M	/	M	
S	Grewia occidentalis	lavender star flower	M	M	M	M	/	M	
P	Grindelia camporum	gum plant	?	?	L	?	?	?	
S	Griselinia littoralis	kapuka	M	/	M	/	/	/	
S	Griselinia lucida	puka	M	/	M	/	/	/	
P	Gunnera magellanica	gunnera	H	/	H	H	/	/	
S	Gutierrezia sarothrae	snakeweed	?	?	/	/	L	L	
P	Gypsophila cerastioides	baby's breath	?	L	M	M	/	/	
P	Gypsophila paniculata	baby's breath	L	L	M	M	/	M	
P	Gypsophila repens	creeping baby's breath	M	M	M	M	/	/	
	Habranthus andersonii (See H. tubispanthus)							/	
P	Habranthus robustus (Zephranthes)	pampas lily	M	M	M	M	/	M	
	Habranthus texanus (See H. tubispanthus)								
P	Habranthus tubispathus	habranthus	M	M	M	M	/	/	
S	Hakea laurina	sea urchin tree	L	L	L	L	/	/	
S	Hakea suaveolens	sweet hakea	L	L	L	L	/	/	
P	Hakonechloa macra	hakone grass	M	M	?	?	?	?	
S	X Halmiocistus B866sahucci	halmiocistus	L	?	L	L	?	?	
S	X Halmiocistus wintonensis	halmiocistus	L	?	L	L	?	?	
S	Halimium lasianthum	sun rose	L	L	L	?	?	?	
S	Hamamelis virginiana	common witch hazel	M	M	/	/	/	/	
S	Hamelia patens	Texas firecracker bush	?	?	?	?	/	M	
V S	Hardenbergia comptoniana	western Australia coral pea	M	M	M	M	/	M	
V S	Hardenbergia violacea	lilac vine	M	M	M	M	/	M	
T	Harpephyllum caffrum	Kaffir plum	M	/	M	M	/	/	
T	Harpullia arborea	tulipwood	/	/	M	/	/	/	
P	Haworthia spp.	haworthia	L	L	L	L	/	L	
S	Hebe spp.	hebe	M	M	M	M	/	/	
GC V	Hedera canariensis	Algerian ivy	M	M	M	M	M	M	☹
GC V	Hedera helix	English ivy	M	M	M	M	M	M	☹ ☹
Gc V	Hedera nepalensis	Himalayan ivy	M	?	?	?	?	?	
P	Hedychium coccinium	red ginger lily	/	/	H	H	/	H	
P	Hedychium coronarium	white ginger lily	M	/	H	H	/	H	
P	Hedychium flavescens	yellow ginger	L	?	H	H	/	H	
P	Hedychium garnerianum	Kahili ginger	M	/	H	H	/	H	
P	Hedychium greenei	red ginger	/	/	H	H	/	H	
P	Helenium bigelovii	Bigelow sneezeweed	L	L	?	?	?	?	
P	Helenium hoopesii	orange sneezeweed	L	L	?	?	?	?	
S	Helianthemum appenium	white rock rose	?	?	?	?	?	?	
P	Helianthemum nummularium	helianthemum	L	L	L	L	/	/	
P	Helianthus angustifolius	swamp sunflower	H	?	?	?	?	?	
P	Helianthus maximiliani	Maximilian sunflower	M	L	?	?	?	?	
P	Helichrysum bracteatum	straw flower	?	L	M	M	?	?	
P	Helichrysum petiolare	licorice plant	?	M	M	M	?	?	☹
S	Helichrysum rosemarinifolium (See Ozothamnus roasemarinifolius)								
P	Helictotrichon sempervirens	blue oat grass	L	L	M	M	M	M	
P	Heliopsis helianthoides scabra	golden sunflower	H	?	?	?	?	?	
P	Heliotropum arborescens	common heliotrope	M	M	M	M	?	M	
P	Helleborus spp.	Christmas/Lenten rose	M	M	M	M	/	/	
P	Hemerocallis spp.	day lily	M	M	M	M	M	M	
Gc	Herniaria glabra	green carpet	H	M	M	M	/	/	
S	Hesperaloe funifera	Coahuilan hesperaloe	/	/	VL	L	L	L	

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S	Hesperaloe parviflora	red/ yellow yucca	/	/	VL	L	L	L	
S	Hesperantha spp.	hesperantha	L	?	?	L	?	?	
S	Heterocentron elegans	Spanish shawl	/	/	?	?	?	?	
S	Heteromeles arbutifolia	toyon	VL	VL	L	L	/	/	
P	Heterotheca villosa (chrysopsis villosa)	hairy golden aster	L	?	?	?	?	?	
P	Heuchera maxima	island alum root	M	/	M	M	/	/	
P	Heuchera micrantha	alum root	M	M	M	M	M	M	
P	Heuchera sanguinea	coral bells	M	M	M	M	M	M	
P	X Heucherella tiarelloides 'Bridget Bloom'	Bridget bloom heucherella	H	H	M	?	?	?	
P	Hibanobambusa tranquillans	inyouchikuzoku	H	?	?	?	?	?	
S	Hibbertia aspera	hibbertia (aspera)	M	/	?	?	?	?	
S	Hibbertia cuniformis	cut leaf Guinea flower	M	M	M	?	/	M	
S Gc	Hibbertia pedunculata	hibbertia (pedunculata)	M	/	?	?		M	
V	Hibbertia scandens	Guinea gold vine	M	M	M	M	/	M	
S	Hibbertia vestita	hibbertia (vestita)	M	/	?	?	?	?	
P	Hibiscus moscheutos	mallow rose	M	M	M	?	?	?	
S	Hibiscus mutabilis	confederate rose	M	M	?	M	?	?	
S	Hibiscus rosa-sinensis	Chinese hibiscus	M	M	M	M	/	H	
S	Hibiscus syriacus	rose of Sharon	L	M	M	M	M	M	
P	Hibiscus trionum	flower-of-an-hour	M	?	?	?	?	?	
P	Hippeastrum spp.	amaryllis	M	M	M	M	?	?	
P	Hippolytia herderi (Tanacetum herderi)	hippolytia	?	?	?	?	?	?	
S	Holodiscus discolor	sea foam	L	?	M	M	/	/	
P	Homeria spp.	cape tulip	?	?	M	M	?	?	
	Homoglossum watsonium (See Gladiolus spp.)								
P	Hosta spp.	plantain lily	M	M	/	/	/	/	
P	Houttuynia cordata 'Chameleon'	chameleon houttuynia	M	M	M	?	?	?	
S	Howea forsterana	Kentia palm	/	/	M	M	/	/	
P	Hunnemannia fumarifolia	Mexican tulip poppy	L	L	M	M	?	?	
S V	Hydrangea anomala petiolaris	climbing hydrangea	M	H	/	H	/	/	
S	Hydrangea arborescens	snowball hydrangea	M	H	?	?	?	?	
S	Hydrangea aspera villosa	lacecap hydrangea	M	H	?	?	?	?	
S	Hydrangea macrophylla	hydrangea	M	H	M	H	H	H	
S	Hydrangea paniculata 'Grandiflora'	peegee hydrangea	M	?	M	?	?	?	
S	Hydrangea quercifolia	oakleaf hydrangea	M	?	M	M	H	H	
S	Hydrangea serrata	blue bird hydrangea	H	?	?	?	?	?	
S	Hymenoclea monogyra	cheese bush	?	?	?	?	VL	VL	
T	Hymenosporum flavum	sweet shade	M	/	M	M	/	/	
	Hymenoxys acaulis (See Tetraneuris acaulis)								
S	Hypericum beanii	Henry St. John's wort	M	M	M	M	M	/	
Gc	Hypericum calycinum	Aaron's beard	M	M	M	M	M	/	
S Gc	Hypericum empetrifolium nanum	hypericim (e nanum)	M	?	?	?	?	/	
S P	Hypericum frondosum	hypericum (frondosum)	M	?	?	?	?	/	
S	Hypericum 'Hidecote'	St.Johnswort	M	M	M	M	M	/	
S	Hypericum X inodorum 'Albury Purple'	Albury purple hypericum	M	?	?	?	?	/	
P	Hypericum kelleri	Keller hypericum	M	?	?	?	?	/	
S P	Hypericum X moseranum	gold flower	M	M	M	M	M	/	
S	Hypericum olympicum	olympic hypericum	L	?	?	?	?	/	
S	Hypericum 'Rowallane'	Rowall hypericum	M	?	?	?	?	/	
P S	Hypoestes aristata	ribbon bush	?	?	M	?	?	?	
P	Hyptis emoryi	desert lavender	?	?	?	?	/	L	
P	Iberis gibraltarica	Gibraltar candytuft	M	?	?	?	?	?	
P	Iberis sempervirens	evergreen candy tuft	M	M	M	M	M	M	
S	Ilex X altaclarensis 'Wilsonii'	Wilson holly	M	M	M	M	M	M	
S	Ilex aquifolium	English holly	L	M	M	M	M	M	☹
S	Ilex cornuta 'Burfordii'	Burford holly	L	M	M	M	M	M	

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S	Ilex crenata	box-leaved holly	M	?	M	M	?	?	
S	Ilex dimorphophilla	Okinawan holly	M	M	M	M	/	?	
P	Ilex integra	Nepal holly	?	?	?	?	?	?	
S	Ilex X meserveae	blue boy/girl etc. cvs.	M	M	M	M	/	?	
S	Ilex verticillata	winterberry	?	?	?	?	?	?	
S	Ilex vomitoria	yaupon	L	M	L	L	M	M	
P	Illicium floridanum 'Alba'	white Florida anise-tree	M	?	?	?	?	?	
P S	Impatiens sodeni (oliveri)	poor man's rhododendron	M	/	H	/	/	/	
S	Impatiens uguensis	impatiens (uguensis)	H	?	H	?	?	?	
P	Imperata cylindrica 'Rubra'	Japanese blood grass	H	H	M	M	?	M	☹
S	Indigofera decora (incarnata)	Chinese indigo	M	?	?	?	?	?	
P	Inula ensifolia	inula	M	?	?	?	?	?	
S	Iochroma cyanea	violet tubeflower	M	?	M	M	/	/	
S	Iochroma fuchsioides	red tubeflower	M	?	M	M	?	?	
P	Ipheion uniflorum (Tritelia)	spring star flower	L	L	L	?	?	?	
V	Ipomea indica (acuminata)	blue dawn flower	L	M	L	M	/	M	
P	Ipomopsis rubra	standing cypress	L	?	?	?	?	?	
P	Iris spp.	Douglas iris hybrids	L	L	M	M	H	/	
P	Iris spp.	bearded iris	L	L	M	M	M	M	
P	Iris spp.	Siberian iris	M	M	H	?	?	?	
P	Iris spp.	Japanese iris	H	H	H	H	/	/	
P	Iris spp.	Spanish/Dutch iris	M	M	M	M	M	M	
S	Isocoma spp. (Haplopappus)	goldenbush	?	?	VL	VL	VL	VL	
P	Isolepis cernua (Scirpus cernuus)	low bull rush	H	H	H	H	H	H	
P S	Isoplexis chalcantha	isoplexis	L	?	?	?	?	?	
S	Isopogon formosus	rose cone flower/drumsticks	L	?	?	?	?	?	
S	Itea ilicifolia	holly sweetspire	M	M	M	M	?	?	
Gc	Iva hayesiana	poverty weed	VL	VL	VL	L	/	/	
P	Ixia spp.	African corn lily	L	I	M	M	?	?	
S	Ixora coccinia	jungle geranium	?	?	M	?	/	?	
T	Jacaranda mimosifolia	jacaranda	M	M	M	M	/	M	
S V	Jasminum angulare	South African jasmine	?	/	M	?	?	?	
S V	Jasminum azoricum	lemon scented jasmine	M	?	M	?	?	?	
S V	Jasminum beesianum	jasmine (beesianum)	M	?	?	?	?	?	
S	Jasminum floridum	showy jasmine	L	M	M	M	/	M	
	Jasminum grandiflorum	see J officinale f.grandiflorum							
S	Jasminum humile	Italian jasmine	L	M	M	M	/	M	
V	Jasminum leratii	jasmine (leratii)	M	?	M	M	/	/	
S	Jasminum mesnyi	primrose jasmine	L	M	M	M	/	M	
S	Jasminum nitidum	angel wing jasmine	L	M	M	M	/	M	
S	Jasminum nudiflorum	winter jasmine	L	L	?	?	?	?	
S	Jasminum officinale f. grandiflorum	common jasmine	L	L	M	M	?	?	
S	Jasminum parkeri	dwarf jasmine	L	L	M	?	?	?	
V	Jasminum polyanthum	pink jasmine	M	M	M	M	/	M	
SV	Jasminum sambac	Arabian jasmine	M	?	M	?	?	M	
V	Jasminum X stephanense	Stephan jasmine	M	?	?	?	?	?	
T	Jatropha integerrima	spicy jatropha	?	?	L	?	?	L	
T	Jubaea chilensis	Chilean wine palm	L	M	L	M	/	/	
T	Juglans californica	S. California black walnut	M	/	L	L	/	/	
T	Juglans hindsii	California black walnut	M	M	/	L	/	/	
T	Juglans major	Arizona walnut	?	?	?	?	?	M	
T	Juglans nigra	eastern black walnut	M	M	/	/	/	/	
T	Juglans regia	English walnut	M	M	M	M	/	/	
P	Juncus spp.	rush	H	H	M	M	?	?	☹
P	Juniperus californica	California juniper	L	L	L	L	L	L	
T	Juniperus scopulorum'Tolleson'	Tolleson's juniper	L	L	M	M	M	M	
T	Juniperus spp.	juniper	L	L	L	M	M	M	
S	Justicia aurea	yellow plume flower	?	?	H	H	?	?	
S	Justicia brandegeana	shrimp plant	M	M	M	M	/	M	
S	Justicia californica	chuparosa	M	/	VL	L	L	M	
S	Justicia candicans	red justicia	?	?	?	?	?	?	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
S	Justicia carnea	Brazilian plume flower	M	H	H	H	/	H	
P	Justicia leonardii	justicia (leonardii)	?	?	?	?	?	?	
S	Justicia sonorea	Sonoran justicia	?	?	?	?	?	L	
S	Justicia spicigera	Mexican honeysuckle	/	?	L	L	/	L	
P	Kalanchoe spp.	kalanchoe	L	L	L	L	/	M	
Gc P	Keckiella antirhinnoides	yellow penstemmon	?	?	L	L	/	/	
Gc P	Keckiella cordifolia	heart-leaved penstemmon	?	?	VL	L	/	/	
V	Kennedia nigricans	black coral pea	L	?	?	?	?	?	
V	Kennedia rubicunda	dusky coral pea	L	?	?	?	?	?	
S	Kerria japonica	Japanese rose	M	M	?	M	M	?	
P	Kirengeshoma koreana	yellow waxbells	H	?	?	?	?	?	
P	Kirengeshoma palmata	yellow waxbells	H	?	?	?	?	?	
P	Kniphofia triangularis (galpinii)	coral poker	M	M	L	L	/	M	
P	Kniphofia uvaria	red hot poker	M	M	L	L	/	M	
P	Koelaria glauca	blue hair grass	M	?	M	M	M	?	
T	Koelreuteria bipinnata	Chinese flame tree	M	M	M	M	/	M	
T	Koelreuteria elegans	Chinese flame tree	M	M	M	M	/	M	
T	Koelreuteria paniculata	golden rain tree	M	M	L	L	M	M	
S	Kolkwitzia amabalis	beauty bush	L	M	M	M	M	/	
S	Kunzea spp.	kunzea	L	/	M	?	?	?	
V	Labab purpureus (Dolichos labab)	hyacinth bean	M	M	M	?	?	?	
T	Laburnum X watereri	golden chain tree	M	M	/	/	/	/	
P	Lachenalia spp.	cowslip	L	L	?	?	?	?	
TS	Lagerstroemia X fauerei	crape myrtle	L	L	M	M	M	M	
T S	Lagerstroemia indica	crape myrtle	L	L	M	M	M	M	
T	Lagunaria patersonii	primrose tree	L	/	L	L	/	/	
S	Lambertia intermis	lambertia	L	?	?	?	?	?	
P Gc	Lamiastrum galeobdolon	yellow archangel	M	M	M	?	?	?	
Gc	Lamium maculatum	spotted deadnettle	M	M	M	?	?	?	
Gc	Lampranthus spp.	ice plant (Lampranthus)	L	L	L	L	/	L	
S	Lantana camara	lantana	L	L	L	L	/	M	
S Gc	Lantana montevidensis (sellowiana)	trailing lantana	L	L	L	L	/	M	
T	Larix decidua	European larch	M	/	/	/	/	/	
P	Larrea tridentata	creosote	VL	VL	VL	L	L	L	
P Gc	Laurentia fluviatilis	blue star creeper	M	M	M	M	?	M	
T S	Laurus nobilis	sweet bay	L	L	L	L	M	M	
T	Laurus 'Saratoga'	Saratoga laurel	L	L	L	L	M	M	
S	Lavandula spp.	lavender	L	L	L	L	M	M	
S	Lavatera assurgentiflora	tree mallow	L	M	L	L	/	M	
S	Lavatera hybrids	lavatera	L	L	M	M	?	?	
S	Lavatera maritima	bush mallow	L	L	M	M	?	?	
S	Lechenaultia formosa orange		L	?	?	?	?	?	
	Lemaireocereus thurberi (See Stenocereus thurberi)								
S	Leonotis leonurus	lion's tail	L	L	L	L	M	M	
P	Leontopodium alpinium	eidelweiss	M	M	?	?	?	?	
S	Lepechinia hastata	Mexican pitcher sage	L	?	M	?	?	?	
T S	Leptospermum laevigatum	Australian tea tree	L	L	L	L	/	/	
T S	Leptospermum petersonii	lemon scented tea tree	L	?	M	M	/	/	
T S	Leptospermum polygalifolium	tea tree	?	?	?	?	/	/	
T	Leptospermum rotundifolium	tea tree	L	L	?	L	/	/	
S Gc	Leptospermum rupestre (humifusum)	tea tree	L	?	?	?	/	/	
T S	Leptospermum scoparium	New Zealand tea tree	M	M	M	M	/	/	
T	Leucadendron argenteum	Silver tree	L	/	L	/	/	/	
T	Leucadendron galpinii	Galpin's leucadendron	?	/	?	?	?	?	
T	Leucadendron hybrids	hybrid leucadendron	L	?	?	?	?	?	
P	Leucanthemum X superbum	Shasta daisy	M	M	M	M	M	M	
P	Leucojum aestivum	summer snowflake	?	L	M	M	?	?	
S	Leucophyllum spp.	purple sage, Texas ranger etc.	L	L	L	L	L	L	
S	Leucospermum cordifolium	nodding pincushion	/	/	L	/	/	/	
S	Leucothoe fontanesiana	drooping laurel	M	?	?	?	?	?	

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TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
P	Lewisia columbiana rupicola	columbia lewisia	L	/	?	?	?	?	
P	Lewisia cotyledon	bitter root	L	/	?	?	?	?	
P	Lewisia hybrids	lewisia	L	/	?	?	?	?	
P	Leymus spp. (also see Elymus spp.)	wild rye	VL	VL	M	M	?	?	
P	Liatris spicata	gay feather	M	M	M	M	M	M	
P	Libertia spp.	libertia	L	?	M	?	?	?	
P	Ligularia tussilaginea (See Farfugium japonicum)								
S	Ligustrum japonicum	Japanese privet	M	M	M	M	M	M	
T	Ligustrum lucidum	glossy privet	L	L	M	M	M	M	☹
S	Ligustrum ovalifolium	California privet	L	L	M	M	?	?	
S	Ligustrum X vicaryi	golden privet	L	L	M	M	?	?	
P	Lilium (garden hybrids)	lily	M	M	M	M	M	M	
P	Limonium commune var. californicum	coastal statice	L	L	L	M	/	/	
P	Limonium perezii	statice	L	L	L	M	/	M	☹
P	Limonium speciosum (See Goniolemon incanum)								
P	Limonium tataricum (See Goniolemon tataricum)								
P	Linaria purpurea	toadflax	L	M	L	M	M	M	
P	Linaria supina	toadflax	?	?	?	?	?	?	
P	Linum spp.	flax	VL	VL	M	?	M	M	
T	Liquidambar styraciflua	sweet gum	M	M	M	M	M	/	
T	Liriodendron tulipifera	tulip tree	M	H	M	H	/	/	
P	Liriope spp.	lilyturf	M	M	M	M	M	M	
T	Lithocarpus densiflorus	tanbark oak	L	/	L	L	/	/	
T	Lithocarpus edulis (Pasania edulis)	Japanese false oak							
P	Lithodora diffusa	heavenly blue	M	M	/	/	/	/	
T	Livistona australis	Australia fountain palm	/	/	M	M	/	/	
T	Livistona chinensis	Chinese fan palm	?	/	M	M	/	/	
T	Livistona mariae	central Australian fan palm	/	/	?	?	?	?	
T	Livistona rigida	livistona (rigida)	/	/	?	?	?	?	
P	Lobelia 'Brightness'	brightness lobelia	H	H	H	?	?	?	
P	Lobelia chinensis	lobelia (chinensis)	H	?	?	?	?	?	
P	Lobelia fulgens	Mexican cardinal flower	H	H	H	?	?	?	
S P	Lobelia laxiflora	Mexican bush lobelia	?	?	VL	VL	?	M	
S	Lobelia ricardii	lobelia (ricardii)	?	?	M	?	?	?	
P	Lobelia richmondensis	perennial lobelia	M	?	M	?	?	?	
P	Lobelia siphilitica	great blue lobelia	?	?	?	?	?	?	
S	Lobostemon fruiticosus	eight-day-healing bush	/	?	L	?	?	?	
P	Lomandra longifolia	spiny headed mat rush	?	?	M	?	?	?	
V	Lonicera confusa	honeysuckle (confusa)	?	?	M	?	?	?	
V	Lonicera hildebrandiana	giant Burmese honeysuckle	M	M	M	M	M	M	
S	Lonicera hispidula	honeysuckle (hispidula)	L	?	L	VL	?	?	
V	Lonicera japonica	Japanese honeysuckle	M	M	L	L	M	M	☹
V Gc	Lonicera japonica 'Halliana'	Hall's honeysuckle	M	M	L	L	M	M	☹
S	Lonicera nitida	box honeysuckle	L	M	/	M	/	/	
V	Lonicera periclymenum	flowering woodbine	L	L	?	?	?	?	
V	Lonicera sempervirens	trumpet honeysuckle	M	M	/	M	M	M	
S	Lonicera subspicata	chaparral honeysuckle	L	?	L	VL	?	?	
V	Lonicera tatarica	tatarian honeysuckle	M	?	?	?	?	?	
T	Lophostemon confertus	Brisbane box	M	/	M	M	/	/	
S	Loropetalum chinense	fringe flower	L	M	M	?	?	?	
Gc	Lotus corniculatus	birdsfoot trefoil	L	M	M	M	/	M	☹
P	Lotus scoparius	deer weed	VL	VL	VL	VL	L	L	
S T	Luculia pinceana	luculia	M	/	?	?	?	?	
S	Luma apiculata	palo Colorado	M	/	M	M	/	/	
S	Lupinus albifrons	silver lupine	VL	L	/	L	/	/	
S	Lupinus arboreus	coastal bush lupine	L	/	L	/	/	/	☹
S	Lupinus excubitus	grape soda lupine	VL	VL	?	?	?	?	
P	Lupinus (Russell hybrids)	Russell lupines	M	M	/	/	/	/	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
P	Lupinus sparsiflorus	arroyo lupin	?	?	?	?	?	?	
P	Luzula nivea	snowy woodrush	M	?	?	?	?	?	
P	Luzula purpurea	purple woodrush	M	?	?	?	?	?	
P	Luzula sylvatica	greater woodrush	M	?	?	?	?	?	
P	Lychnis alpina	alpine campion	M	M	?	?	?	?	
P	Lychnis chalcedonica	Maltese cross	M	M	M	M	M	M	
P	Lychnis coronaria	rose campion/crown pink	L	L	L	L	M	M	
S	Lycianthus rantonnetii	Paraguay nightshade/blue potato bush M	M	M	M	M	/	M	
S	Lycium exertum	boxthorn	/	?	?	?	?	?	
S	Lycium fremontii	wolfberry	/	L	L	L	L	L	
T	Lyonothamnus floribundus	Catalina ironwood	L	/	VL	L	/	/	
T S	Lysiloma candida	palo blanca	/	/	?	?	/	M	
T S	Lysiloma microphylla var. thornberi	feather bush	?	/	L	L	/	M	
P Gc	Lysimachia spp.	loosestrife/moneywort	H	H	H	H	/	/	☹
T	Macadamia spp.	macadamia nut	M	/	M	M	/	/	
V	Macfadyena unguis-cati	cat's claw	L	L	L	L	L	L	
S	Mackaya bella	forest bell bush	M	?	M	M	/	/	
P	Macleaya spp.	plume poppy	M	?	M	?	?	?	
T	Magnolia grandiflora	southern magnolia	M	M	M	M	/	H	
T	Magnolia hybrids	hybrid magnolias	M	M	?	?	?	?	
T S	Magnolia X loebneri	loebner magnolia	M	M	?	?	?	?	
T S	Magnolia sieboldii	oyama magnolia	M	M	?	?	?	?	
T	Magnolia X soulangiana	saucer magnolia	M	M	M	M	/	/	
T	Magnolia stellata	star magnolia	M	M	M	M	/	/	
T	Magnolia X veitchii	veitch magnolia	M	M	?	?	?		
S	Mahonia aquifolium	Oregon grape	M	M	M	M	M	M	
S	Mahonia bealei	leatherleaf mahonia	M	M	M	M	M	M	
S	Mahonia fortunei	chinese mahonia	M	M	?	?	?	?	
S	Mahonia 'Golden Abundance'	golden abundance mahonia	L	L	L	M	M	M	
S	Mahonia lomariifolia	Chinese holly grape	M	M	L	M	M	M	
S	Mahonia nervosa	longleaf mahonia	M	?	?	M	?	?	
S	Mahonia nevinii	Nevin mahonia	VL	L	L	L	M	M	
S	Mahonia pinnata & cvs.	California holly grape	L	L	M	M	M	M	
Gc	Mahonia repens	creeping mahonia	L	L	L	M	M	/	
P	Maianthemum dilatatum	May lily	M	H	?	?	?	?	
S	Maireana sedifolia	pearl bluebush	?	?	L	?	?	?	
S	Malacothamnus clementinus	San Clemente Island bush mallow							
S	Malacothamnus fasciculatus	bush mallow	VL	L	VL	L	/	/	
S	Malacothamnus fremontii	Fremont's bush mallow	VL	L	?	?	?	?	
Gc	Maleophora spp.	ice plant (Maleophora)	L	L	L	L	/	L	☹
S	Malosma laurina (Rhus laurina)	laurel sumac	VL	L	VL	L	/	/	
T	Malus spp.(edible)	apple	M	M	M	M	M	/	
T	Malus hybrids	crabapple	M	M	/	M	M	/	
S	Malvaviscus arboreus	Turk's cap	M	?	M	M	/	/	
V	Mandevilla laxa	Chilean jasmine	M	/	M	M	/	M	
S	Mandevilla splendens	mandevilla	M	/	M	M	/	M	
V	Mandevilla cvs.	'Alice Dupont' etc.	M	/	M	H	/	H	
	Mandevilla suaveolens (See M. laxa)								
P	Manfreda spp.	manfreda	L	?	?	?	?	?	
T	Markhamia lutea (hildebrandtii)	markhamia	?	/	M	/	/	/	
V	Mascagnia lilacina	purple orchid vine	?	?	?	?	?	M	
V	Mascagnia macroptera	yellow orchid vine	?	?	?	?	?	M	
P	Matteuccia struthiopteris	ostrich fern	?	?	M	H	?	?	
	Maurandya antirriniflora (See Asarina antirriniflora)								
	Maurandya barclaiana (See Asarina barclaiana)								
	Maurandya erubescens (See Asarina erubescens)								

			REGIONAL EVALUATIONS						
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T	Maytenus boaria	mayten tree	M	M	M	M	/	/	
S T	Maytenus phyllanthoides	mangle dulce	?	?	?	?	?	?	
P Gc	Mazus reptans	mazus	M	H	M	H	?	?	
T S	Melaleuca armillaris	bracelet honey-myrtle	VL	/	L	M	/	M	
T S	Melaleuca decussata	totem poles (lilac melaleuca)	VL	/	L	M	/	M	
T S	Melaleuca elliptica	granite honey-myrtle	VL	/	L	M	/	M	
T	Melaleuca ericifolia	heath melaleuca	L	/	?	?	?	?	
S	Melaleuca fulgens	melaleuca (fulgens)	L	?	L	M	/	M	
S	Melaleuca huegelii	chenile honey-myrtle	?	/	L	M	/	M	
S	Melaleuca incana	grey honey-myrtle	L	?	L	M	/	M	
T	Melaleuca lanceolata	black tea	?	L	?	L	/	/	
T	Melaleuca linariifolia	flax leaf paper bark	L	L	L	L	/	/	
T	Melaleuca nesophila	pink melaleuca	L	L	L	L	/	/	
T	Melaleuca quinquinervia (See Melaleuca viridifolia var rubifolia)								
T	Melaleuca rhaphiophylla	swamp paper bark	?	/	?	L	/	/	
T	Melaleuca squamea	swamp honey-myrtle	?	?	L	M	/	M	
T	Melaleuca styphelioides	prickly-leaved paperback	L	L	L	M	/	M	
T	Melaleuca thymifolia	thyme honey-myrtle	L	L	?	?	?	?	
T	Melaleuca viridiflora var. rubiflora	cajeput tree	L	L	M	M	/	M	☹
S	Melaleuca wilsonii	Wilson melaleuca	L	L	?	?	?	?	
P	Melampodium leucanthum	blackfoot daisy	L	/	?	L	L	L	
T	Melia azedarach	chinaberry	VL	L	VL	L	L	L	
S	Melianthus major	honey bush	L	M	M	M	/	M	
P Gc	Melissa officinalis	lemon balm	?	M	M	?	?	?	
Gc P	Mentha spp.	mint	L	M	M	M	M	M	☹
V	Merremia aurea	merremia (aurea)	?	?	?	?	/	M	
V	Merremia quinquefolia	merremia (quinquefolia)	?	?	?	?	/	M	
T	Meryta sinclairii	puka	/	/	M	?	/	/	
T	Metasequoia glyptostroboides	dawn redwood	H	H	H	H	/	/	
T	Metrosideros excelsa	New Zealand Christmas tree	L	/	M	M	/	/	
S	Metrosideros collinia	Lehua of Hawaii	?	?	?	?	?	?	
	Metrosideros tomentosa (see M. excelsa)								
T	Michelia champaca	fragrant Himalayan champaca	M	?	M	?	/	/	
T	Michelia doltsopa	wong-lan	M	M	M	M	/	/	
S	Michelia figo	banana shrub	M	M	M	H	/	H	
T	Michelia X foggi 'Jack Fogg'	Jack Fogg michelia	M	?	?	?	?	?	
S Gc	Microbiota decussata	Siberian cypress	M	?	?	?	?	?	
P	Microlepia strigosa	lace fern	M	/	M	H	/	/	
P	Milium effusum	golden wood millet	M	?	?	?	?	?	
V	Milletia reticulata	evergreen wisteria	M	?	M	M	/	/	
V	Milletia taiwanensis	Chinese evergreen wisteria	H	?	?	?	?	?	
S	Mimulus spp. (shrubby)	monkey flower	L	L	L	L	/	/	
P	Mimulus spp. (herbaceous)	monkey flower	H	H	H	H	/	/	
P	Mirabilis california	wishbone bush	?	?	M	?	?	?	
P	Mirabilis jalapa	four o'clock	VL	L	/	L	M	M	
P	Mirabilis multiflora	giant four o'clock	?	L	?	?	?	?	
P	Miscanthus sinensis	eulalia grass	H	H	M	M	M	M	
P	Miscanthus transmorrisonensis	evergreen eulalia	H	H	M	M	M	M	
P	Molinia caerulea	Moor grass	M	?	?	?	?	?	
P	Monarda didyma	bee balm	M	M	M	M	M	M	
P	Monardella linoides ssp. viminea	San Diego willowy mint	L	?	M	?	?	?	
P	Monardella macrantha	scarlet monardella	L	?	?	?	?	?	
P	Monardella odoratissima	mountain pennyroyal	/	?	M	?	?	?	
P	Monardella villosa	coyote mint	VL	VL	VL	L	?	M	
P	Monochaetum volcanicum	monochaetum	M	?	?	?	?	?	
S	Montanoa grandiflora	daisy tree	M	?	M	?	?	?	
P	Moraea spp. (summer growing)	moraea	M	M	?	?	?	?	
P	Moraea spp.(winter growing)	morea	VL	VL	?	?	?	?	
P	Morina longifolia	whorlflower	M	?	?	?	?	?	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
T	Morus alba	white mulberry	M	M	M	M	M	M	
Gc V	Muehlenbeckia axillaris	creeping wire vine	M	M	M	M	/	M	
Gc V	Muehlenbeckia complexa	mattress vine	L	L	M	M	/	M	
P	Muhlenbergia capillaris	hairy awn muhly	L	?	M	?	M	M	
P	Muhlenbergia dumosa	bamboo muhly	L	?	M	M	M	M	
P	Muhlenbergia emersleyi	bull grass	M	?	?	?	?	M	
P	Muhlenbergia lindheimeri	Lindheimer muhly	L	?	?	M	?	M	
P	Muhlenbergia pubescens	soft muhly	L	?	?	?	?	M	
P	Muhlenbergia rigens	deer grass	L	M	L	M	M	M	
S	Murraya paniculata	orange jessamine	/	H	M	M	/	M	
P	Muscari macrocarpum	grape hyacinth	VL	VL	VL	VL	M	H	
S P	Musa spp.	banana	H	H	H	H	/	H	
T S	Myoporum laetum	myoporum	L	M	M	M	/	/	☹
S Gc	Myoporum X 'Pacificum'	pacifica saltbush	L	L	L	M	/	/	
S Gc	Myoporum parvifolium & cvs.	myoporum	L	L	L	L	/	M	
P	Myosotis scorpioides	forget-me-not	M	M	/	M	/	H	☹
S	Myrica californica	Pacific wax myrtle	L	L	L	M	/	/	
S	Myrica pennsylvanica	bayberry	M	M	?	?	/	/	
S	Myrica rubra	Chinese strawberrry tree	?	?	?	?	?	?	
S	Myrsine africana	African boxwood	L	L	L	M	/	/	
S	Myrtus communis	true myrtle	L	L	L	M	M	M	
T	Nageia nagi (Podocarpus nagi)	Nageia	M	M	M	M	?	M	
S	Nandina domestica	heavenly bamboo	L	L	L	M	M	M	
S	Nandina domestica 'Purpurea'	heavenly bamboo (Nana)	M	M	M	M	M	M	
P	Narcissus spp.	daffodil	VL	VL	L	L	L	L	
P	Nassella cernua	nodding needlegrass	VL	L	VL	VL	VL	L	
P	Nassella lepida	foothill needlegrass	VL	L	VL	VL	VL	L	
P	Nassella pulchra	purple needlegrass	VL	L	VL	VL	VL	L	
P	Nassella tenuissima	Texas needle grass	?	?	VL	VL	VL	L	
P	Nauplius sericeus (Asteriscus sericeus)	Canary island daisy	L	?	VL	/	/	/	
T	Neodypsis decaryi	triangle palm	?	/	M	M	/	/	
P	Neomarica caerulea	poor man's orchid	L	?	M	?	?	?	
P	Nepeta spp.	catmint/catnip	L	M	M	M	M	M	
P	Nephrolepis cordifolia	southern sword fern	M	M	M	M	M	M	
P	Nephrolepis exaltata	Boston fern	/	M	M	M	M	M	
P	Nerine spp.	nerine	L	L	L	L	M	M	
S	Nerium oleander	oleander	L	L	L	L	M	M	☹
P	Nierembergia hippomanica	cup flower	M	M	M	M	/	M	
TS	Nolina recurvata (Beaucarnea recurvata)	bottle palm	/	/	L	L	/	L	
S P	Nolina spp.	bear grass	VL	VL	VL	VL	L	L	
T	Nyssa sylvatica	sour gum/tupelo	M	M	M	H	/	/	
S	Ochna serrulata	bird's eye bush	L	/	M	M	/	/	
S	Odontonema strictum	firespike	?	?	?	?	?	?	
Gc	Odontospermum hybrida	gold coin	?	L	M	M	?	?	
P	Oenanthe javanica	water dropwort	H	?	?	?	?	?	☹
	Oenothera berlandieri (See Oenothera speciosa)								
P	Oenothera caespitosa	tufted (white) evening primrose	L	?	/	L	L	L	
	Oenothera cherianthifolia (See Camissonia cherianthifolia)								
P	Oenothera fruiticosa	golden sundrops	M	?	VL	/	/	/	
	Oenothera missouriensis (See O. macrocarpa)								
P Gc	Oenothera macrocarpa	Ozark sundrops	M	M	L	?	L	L	
P	Oenothera pallida	evening primrose (pallida)	L	?	L	?	L	L	
P	Oenothera rosea	evening primrose (rosea)	M	?	L	?	?	?	
Gc P	Oenothera speciosa	Mexican/white evening primrose	L	L	L	L	M	M	
Gc P	Oenothera speciosa 'Rosea'	pink evening primrose	L	L	L	L	M	M	
Gc P	Oenothera stubbei	Baja evening primrose	L	L	L	L	L	L	

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	Oenothera tetragona (See O. fruticosa spp. glauca)								
T	Olea europaea	olive	VL	VL	L	L	M	M	☹
T	Olmediella betschleriana	Guatemalan holly	M	/	M	M	/	/	
T	Olneya tesota	desert ironwood	/	/	/	/	L	L	
P	Omphalodes cappadocica	navelwort	M	M	M	?	?	?	
P	Omphalodes verna	creeping forget-me-not	M	?	?	?	?	?	
P	Onoclea sensibilis	sensitive fern	H	H	M	?	?	?	
P	Ophiopogon clarkii	Clark lily turf	M	M	M	M	M	M	
P	Ophiopogon jaburan	giant lily turf	M	M	M	M	M	M	
P	Ophiopogon japonicus	mondo grass	M	M	M	M	M	M	
P	Ophiopogon planiscapus var. nigrescens	black mondo grass	M	M	M	M	M	M	
S	Opuntia spp.	prickly pear/cholla	VL	VL	VL	L	L	L	
P	Origanum spp.	dittany/oregano etc.	M	M	L	L	M	L	
P	Ornithogalum thyrsoides	chincherinchee	?	?	L	L	?	?	
P	Orthosiphon labiatus	shell bush	M	?	?	?	?	?	
P	Orthrosanthus chimboracensis centroamericanus	orthrosantus	L	?	?	?	?	?	
P	Orthrosanthus multiflorus	orthrosantus	L	?	?	?	?	?	
S	Osmanthus spp.	sweet olive/osmanthus	M	M	M	M	M	M	
P	Osmunda cinnamomea	cinnamon fern	H	H	H	H	/	/	
P	Osmunda regalis	royal/flowering fern	H	H	H	?	/	/	
Gc	Osteospermum spp.	African daisy	L	L	L	L	/	M	
P S	Otatea acuminata (aztecorum)	Mexican weeping bamboo	M	?	M	M	/	H	
P	Otholobium fruiticans	blue cape pea	?	?	M	?	?	?	
P	Oxalis spp.	sorrel/shamrock	M	M	M	M	?	?	
P	Oxera pulchella	royal climber	?	/	M	M	/	/	
T	Oxydendrum arboreum	sourwood tree	M	M	/	?	?	/	
P	Oxypetalum caeruleum (See Tweedia caesulea)								
S	Ozothamnus rosemarinifolius (Helichrysum)	ozothamnus	M	?	L	?	?	?	
T	Pachycormis discolor	elephant tree	?	?	L	?	/	L	
T	Pachypodium lamerei	Madagascar palm	?	/	L	M	/	M	
Gc	Pachysandra terminalis	Japanese spurge	M	M	M	/	M	/	
P	Paeonia spp.	peony	M	M	/	/	/	/	
V	Pandorea jasminoides	bower vine	M	/	M	M	/	/	
V	Pandorea pandorana	wonga wonga vine	M	/	M	M	/	/	
P	Panicum virgatum cvs.	switch grass	M	?	?	?	?	?	
P	Panicum (native spp.)	switch grass	?	?	L	L	VL	VL	
P	Papaver orientale	oriental poppy	M	M	M	M	M	H	
P	Papaver pilosum	poppy	L	/	M	?	?	?	
P	Parahebe spp.	veronica/speedwell	M	?	M	?	?	?	
T	Parkinsonia aculeata	Mexican palo verde/ Jerusalem thorn	VL	VL	L	L	L	L	
T	Parkinsonia florida (Cercidium floridum)	blue palo verde	VL	VL	VL	L	/	L	
T	Parrotia persica	Persian witch hazel	M	?	/	?	?	/	
V	Parthenocissus henryana	silver vein creeper	M	?	M	?	?	?	
Gc V	Parthenocissus quinquefolia	Virginia creeper	M	M	M	M	M	M	
Gc V	Parthenocissus tricuspidata	Boston ivy	M	M	M	M	M	M	
	Pasania edulis (See Lithocarpus edulis)								
V	Passiflora spp.	passion vine	M	M	M	M	/	M	
P	Pattersonia drummondii	pattersonia	M	?	M	?	?	?	
T	Paulownia kawakamii	sapphire dragon tree	?	?	M	M	?	/	
T	Paulownia tomentosa	empress tree	M	H	M	M	?	/	
S	Pavonia praemorsa	yellow mallow	?	?	M	?	?	?	
P	Pelargonium cordifolium	heartleaf geranium	M	?	M	M	?	?	
P	Pelargonium domesticum	Martha Washington pelargonium	M	M	M	M	/	M	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
P	Pelargonium X hortorum	garden geranium	L	L	M	M	/	M	
Gc P	Pelargonium peltatum	ivy geranium	M	M	M	M	/	M	
P Gc	Pelargonium sidoides	geranium (sidoides)	M	?	L	?	?	?	
P	Pelargonium tomentosum	peppermint-scented geranium	M	M	L	M	?	?	
P	Pellaea mucronata	bird's foot fern	L	?	M	?	?	?	
P	Pellaea rotundifolia	button fern	M	?	M	?	?	?	
P	Pennisetum alopecuroides	black pennisetum	L	L	L	L	L	L	
P	Pennisetum orientale	Chinese fountain grass	M	?	L	?	?	?	
	Pennisetum machrostachym (see P. setaceum)								
P	Pennisetum setaceum	fountain grass	L	L	L	L	L	L	☹ ☹
P	Pennisetum setaceum cvs,	purple/burgundy fountain grass	M	L	M	L	L	L	
P	Penstemon hybrids	penstemon (hybrids)	M	M	M	M	M	M	
P	Penstemon wild spp.	penstemon (wild)	L	L	L	L	L	L	
	Pentapterygium (See Agapetes)								
S	Perityle incana	Guadalupe island rock daisy	/	?	?	?	?	/	
	Pernetteya mucronata (See Gaultheria mucronata)								
S P	Perovskia spp.	Russian sage	M	M	M	M	L	L	
T	Persea americana	avocado	M	M	M	M	/	/	
	Petalostemon purpureum (See Dalea gattingeri)								
V	Petrea volubilis	queens wreath	?	/	M	M	?	?	
P	Phalaris spp. (ornamental)	ribbon grass	M	M	M	M	/	/	☹
S	Philadelphus lewisii californicus	wild mock orange	M	?	M	M	?	?	
S	Philadelphus mexicanus	evergreen mock orange	L	M	M	M	M	M	
S	Philadelphus X virginalis	double mock orange	M	M	M	/	/	/	
S P	Philodendron bipinnatifidum (selloum)	tree philodendron	M	M	M	M	/	M	
P	Phlebodium aureum (Polypodium aureum)	rabbit's foot fern	M	?	M	?	?	?	
P	Phlomis caballeroi	phlomis (caballeroi)	?	?	L	L	?	?	
S P	Phlomis cashmeriana	phlomis (cashmeriana)	?	?	L	L	?	?	
P	Phlomis cretica	phlomis (cretica)	?	?	L	L	?	?	
S P	Phlomis fruticosa	Jerusalem sage	L	L	L	L	M	M	
S P	Phlomis italica	phlomis (italica)	L	M	L	L	?	?	
P	Phlomis lanata	phlomis (lanata)	L	?	L	L	?	?	
P	Phlomis purpurea	phlomis (purpurea)	?	?	L	L	?	?	
P	Phlomis russeliana	phlomis (russeliana)	L	?	M	M	?	?	
S	Phlomis tuberosa	phlomis (tuberosa)	M	?	L	L	?	?	
P	Phlox (shrubby cvs.)	phlox	M	M	M	M	M	M	
Gc P	Phlox subulata	moss pink	M	M	/	/	M	M	
T	Phoenix canariensis	Canary Island date palm	L	L	L	L	M	M	
T	Phoenix dactylifera	date palm	L	L	L	L	M	M	
T	Phoenix reclinata	Senegal date palm	/	/	M	M	/	M	
T	Phoenix roebelenii	pigmy date palm	L	/	M	M	/	M	
T	Phoenix rupicola	cliff date palm	/	/	M	M	/	/	
S	Phormium hybrids	flax	L	M	M	M	/	M	
S	Phormium tenax	New Zealand flax	L	L	L	M	/	M	
T S	Photinia X fraseri	Fraser photinia	M	M	M	M	M	M	
T S	Photinia serratifolia (P. serrulata)	Chinese photinia	M	M	/	M	M	M	
S	Phygelius X rectus	cape fuchsia	M	?	M	?	?	?	
Gc	Phyla nodiflora (Lippia nodiflora)	cape weed	L	M	L	L	/	M	☹
	Phyllitis scolopendrium (See Asplenium scolopendrium)								
S	Phyllostachys spp.	bamboo (Phylostachys)	L	L	M	M	M	M	
P	Physostegia virginiana	obedient plant	M	M	M	M	M	M	
T	Picea abies	Norway spruce	M	M	M	/	/	/	
T	Picea glauca	Alberta spruce	M	M	/	/	M	/	
T	Picea mariana	black spruce	?	?	?	?	?	/	
T	Picea omorika	Serbian spruce	?	?	?	?	?	/	

			REGIONAL EVALUATIONS						
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T	Picea orientalis	oriental spruce	?	?	?	?	?	/	
T	Picea pungens	Colorado spruce	M	M	M	M	M	/	
S	Pieris formosa var.forestii	Chinese pieris	M	M	/	/	/	/	
S	Pieris japonica (taiwanensis)	lily-of-the-valley shrub	M	M	/	/	/	/	
S	Pimelea ferruginia	rice flower	M	/	/	/	?	?	
S	Pimelea prostrata	rice flower	M	/	/	/	?	?	
P	Pinellia ternata	pinellia	M	?	M	?	?	?	
T	Pinus attenuata	knobcone pine	L	L	L	L	/	/	
T	Pinus X attenuradiata	knobcone-Monterey pine	M	/	L	M	/	/	
T	Pinus brutia	Calabrian pine	L	L	L	L	M	M	
T	Pinus brutia ssp. eldarica	eldarica pine	L	L	L	L	L	L	
T	Pinus canariensis	Canary Island pine	L	L	L	M	M	M	
T	Pinus contorta	beach pine	M	M	/	/	/	/	
T	Pinus coulteri	Coulter pine	L	L	L	L	M	/	
T	Pinus densiflora	Japanese red pine	M	M	/	M	/	/	
T	Pinus edulis	pinyon pine	L	L	VL	L	L	/	
	Pinus eldarica (See P brutia spp. eldarica)								
T	Pinus flexilis	limber pine	?	?	L	?	?	?	
T	Pinus halepensis	Aleppo pine	L	L	L	L	L	L	
T	Pinus heldreichii	Bosnian pine	M	?	?	?	?	?	
T	Pinus jeffreyi	Jeffrey pine	L	L	/	/	/	/	
	Pinus leucodermis (See P. heldreichhi)								
T	Pinus monophylla	single leaf pinyon pine	L	/	L	L	L	/	
T	Pinus montezumae	Montezuma pine	L	?	L	L	/	/	
S	Pinus mugo	mugo pine	L	L	/	M	M	/	
T	Pinus muricata	bishop pine	M	M	L	/	/	/	
T	Pinus nigra	Austrian black pine	M	M	/	M	M	/	
T	Pinus parviflora	Japanese white pine	M	M	/	/	?	/	
T	Pinus patula	Jelecote pine	M	M	M	M	M	M	
T	Pinus pinaster	cluster pine	M	M	L	/	/	/	☹
T	Pinus pinea	Italian stone pine	L	L	L	L	M	M	☹
T	Pinus ponderosa	ponderosa pine	L	L	/	L	/	/	
T	Pinus radiata	Monterey pine	M	/	M	M	/	/	☹
T	Pinus roxburghii	chir pine	M	M	M	M	M	M	
T	Pinus sabiniana	foothill/Gray pine	VL	VL	VL	L	/	/	
T	Pinus strobus	eastern white pine	M	?	/	/	?	/	
T	Pinus sylvestris	Scotch pine	M	M	/	M	/	/	
T	Pinus thumbergii	Japanese black pine	M	M	M	M	M	M	
T	Pinus torreyana	Torrey pine	L	L	L	M	/	/	
T	Pisonia umbellifera	bird catcher tree	?	/	M	?	/	/	
T	Pistacia chinensis	Chinese pistache	L	L	M	M	M	M	
T S	Pistacia lentiscus	mastic tree	VL	?	M	M	?	?	
T	Pistacia vera	pistachio	L	L	M	M	/	/	
T	Pithecellobium flexicaule	Texas ebony	?	?	/	?	/	L	
T	Pithecellobium pallens	tenaza	?	?	?	?	L	L	
V	Pithecoctenium crucigerum	pithecoctenium	?	?	M	M	?	?	
T S	Pittosporum crassifolium	evergreen pittosporum	M	M	M	M	/	/	
T S	Pittosporum eugenioides	tarata	M	M	M	M	/	/	
T	Pittosporum phillyraeoides	willow pittosporum	M	M	L	L	/	M	
T S	Pittosporum rhombifolium	Queensland pittosporum	M	/	M	M	/	/	
T S	Pittosporum tenuifolium	tawhiwhi	M	M	M	M	/	/	
S	Pittosporum tobira	mock orange	L	M	M	M	M	M	
S	Pittosporum tobira 'Wheelers Dwarf'	dwarf pittosporum	M	M	M	M	M	M	
T	Pittosporum undulatum	victorian box	M	/	M	M	/	/	
T	Platanus X acerifolia and cvs.	London plane	M	M	M	M	H	H	
T	Platanus occidentalis 'Glabrata'	Texas sycamore	?	?	?	?	?	?	
T	Platanus racemosa	California sycamore	M	M	M	M	H	H	
T	Platanus wrightii	Arizona sycamore	M	?	M	M	H	H	
S	Platycladus orientalis	oriental arborvitae	M	M	M	M	M	M	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
P	Platycodon grandiflorus	balloon flower	M	M	M	M	M	M	
S	Plecostachys serpyllifolia (Helichrysum)	straw flower	L	L	L	L	M	M	
S P Gc	Plectranthus spp.	Swedish ivy	M	/	M	M	/	/	
P	Pleioblastus spp.	dwarf bamboo	M	?	M	?	?	?	
S	Plumbago auriculata (campense)	cape plumbago	L	M	M	M	/	M	
S	Plumbago scandens	summer snow	?	?	?	M	/	L	
S	Plumeria rubra	frangipani	/	/	L	/	/	M	
P	Poa costineata	Australian blue grass	M	?	?	?	?	?	
	Podocarpus gracilior (See Afrocarpus gracillior)								
T	Podocarpus henkelii	long leaf yellow wood	M	H	M	M	M	/	
T	Podocarpus latifolius	yellow wood	M	?	M	/	/	/	
T S	Podocarpus macrophyllus	yew pine	M	M	M	M	M	M	
	Podocarpus nagi (See Nageia nagi)								
S	Podocarpus nivalis	alpine totara	M	?	?	?	?	?	
T	Podocarpus totara	totara	?	?	M	M	?	?	
V	Podranea ricasoliana	pink trumpet vine	/	M	M	M	/	M	
P	Polemonium spp.	Jacob's ladder	H	H	M	M	?	?	
P	Poliomintha longiflora	Mexican oregano	L	?	?	?	L	L	
P	Polyanthes tuberosa	tuberose	M	M	L	?	L	L	
S	Polygala X dalmaisiana	sweet pea shrub	L	M	M	M	/	/	
P	Polygonatum odoratum (japonicum)	Soloman's seal	H	/	M	?	?	?	
V	Polygonum aubertii	silver lace vine	L	L	L	L	M	M	
P	Polypodium (native spp.)	plypody	VL	?	?	?	?	?	
P	Polypodium (subtropical spp.)	polypody	M	?	?	?	?	?	
P	Polystichum californicum	sword fern	L	M	M	H	/	/	
P	Polystichum munitum	western sword fern	M	M	M	H	/	H	
P	Polystichum polyblepharum	Japanese lace fern	M	H	H	H	M	M	
P	Polystichum X setigerum	Alaskan fern	M	H	H	H	M	M	
T	Populus alba 'Pyramidalis'	bolleana poplar	M	M	M	M	H	H	
T	Populus balsamifera	balsam/balm of Gilead poplar	M	M	M	M	H	H	
T	Populus X canadensis	Carolina poplar	H	H	?	M	H	H	
T	Populus fremontii	western cottonwood	M	M	M	M	H	H	
T	Populus 'Mohavensis'	Mohave poplar	?	?	?	?	M	M	
T	Populus nigra 'Italica'	Lombardy poplar	M	M	M	M	H	H	
T	Populus 'Red Caudina'	cottonless cottonwood	?	?	?	?	?	?	
T	Populus trichocarpa	black cottonwood	H	H	M	M	H	/	
S P	Portulacaria afra	elephant's food	L	L	L	L	/	L	
S	Potentilla fruticosa cvs.	cinquefoil	M	M	/	/	M	/	
Gc	Potentilla neumanniana (tabernaemontani)	spring cinquefoil	M	M	M	M	/	M	
P Gc	Pratia angulata	pratia	H	H	H	H	/	/	
T	Prosopis alba	Argentine mesquite	/	L	L	L	M	M	
	Prosopis chilensis (See P. glandulosa)								
T	Prosopis glandulosa	Chilean mesquite	/	L	L	L	L	L	
T	Prosopis glandulosa glandulosa	Honey mesquite	/	L	L	L	L	L	
T	Prosopis juliflora	Arizona mesquite	?	?	L	L	L	L	
T	Prosopis pubescens	screwbean mesquite	/	L	L	L	M	M	
T	Prosopis velutina	velvet mesquite	/	L	L	L	M	M	
S	Prostanthera denticulata	mint bush	L	?	?	?	?	?	
S	Prostanthera lasianthos	victorian dogwood	M	?	?	?	?	?	
S	Prostanthera rotundifolia	round leaf mint bush	L	M	L	M	/	/	
S P	Protea spp.	protea	M	/	M	M	/	/	
Gc P	Prunella spp.	self heal	M	M	M	M	?	?	
T S	Prunus caroliniana	Carolina laurel cherry	L	L	M	M	M	M	
T S	Prunus ilicifolia	holly leaf cherry	L	L	VL	VL	/	/	
T S	Prunus lauroceracus	English laurel	M	M	/	H	/	/	
T S	Prunus lusitanica	Portugal laurel	L	L	/	/	/	/	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
T S	Prunus lyonii	Catalina cherry	L	L	L	L	/	/	
T	Prunus sargentii	Sargent cherry	M	?	M	?	?	/	
T	Prunus spp. (edible)	almond	L	M	M	M	M	/	
		apricot	M	M	M	M	M	/	
T	Prunus spp. (edible)	cherry	M	M	M	M	M	/	
		peach	M	M	M	M	M	/	
		peach (low chill only)	M	M	M	M	/	M	
		nectarine	M	M	M	M	M	/	
		plum	M	M	M	M	M	/	
		plum (low chill only)	L	M	M	M	/	M	
		prune	L	M	M	M	M	/	
T	Prunus spp. (ornamental)	flowering cherry	M	M	M	M	M	/	
		flowering peach	L	M	M	M	M	/	
		flowering plum	L	M	M	M	M	M	
T	Pseudobomax ellipticum	shaving brush	?	?	L	?	/	L	
V	Pseudogynoxys chenopodiodes (Senecio)	Mexican flame vine	M	M	M	?	?	?	
T	Pseudolarix kaempheri	golden larch	?	?	/	/	?	/	
T S	Pseudopanax lessonii	houpara	M	?	M	/	/	?	
S	Pseudosasa japonica	arrow bamboo	M	?	M	M	?	?	
P	Pseudosasa japonica tsutsumiana	dwarf arrow bamboo	M	?	M	M	?	?	
	Psidium cattleianum (See P. littorale var. longipes)								
S T	Psidium guajava	common guava	/	/	M	/	/	M	
S T	Psidium littorale var. longipes	strawberry guava	M	M	M	/	/	M	
S P	Psilostrophe cooperi	paper flower	?	?	?	?	L	L	
S P	Psilostrophe tagetina	paper flower	?	?	?	L	L	L	
S	Psoralea pinnata	blue pea	M	?	L	M	?	?	
S	Psorothamnus spinosa (Dalea spinosa)	smoke tree	/	L	/	L	L	L	
P	Pteris spp.	brake fern	M	M	M	H	H	/	
P	Pulmonaria spp.	lungwort	M	H	/	?	?	?	
P	Pulsatilla vulgaris (Anemone pulsatilla)	Pasque flower	M	M	\	?	?	?	
T	Punica granatum	pomegranate	L	L	M	M	M	M	
S	Punica granatum 'Nana'	dwarf pomegranate	L	L	M	M	M	M	
P	Puya spp.	puya	VL	?	L	L	/	M	
S Gc	Pyracantha spp.	firethorn	L	L	L	M	M	M	☹
P	Pyrethropsis hosmariense	Moroccan daisy	L	?	L	?	?	?	
	Pyrethrum roseum (See Tanacetum coccinium)								
V	Pyrostegia venusta	flame vine	/	/	M	M	/	M	
P	Pyrrosia spp.	felt fern	L	/	L	?	?	?	
T	Pyrus calleryana cultivars	Callery pear	M	M	M	M	M	M	
T	Pyrus communis	edible pear	M	M	M	M	M	/	
T	Pyrus kawakamii	evergreen pear	M	M	M	M	M	M	
T	Quercus agrifolia	coast live oak	VL	VL	L	L	/	M	
T S	Quercus berberidifolia	California scrub oak	VL	VL	VL	VL	L	/	
T	Quercus buckleyi	Texas red oak	?	?	/	?	?	?	
T	Quercus chrysolepis	canyon live oak	VL	L	L	L	/	/	
T	Quercus coccinea	scarlet oak	M	M	/	M	/	/	
T	Quercus douglasii	blue oak	VL	VL	VL	L	/	/	
T S	Quercus dumosa	Nutall's scrub oak	VL	VL	VL	VL	L	/	
T	Quercus engelmannii	mesa oak	/	L	L	L	/	/	
T	Quercus fusiformis	escarpment live oak	?	?	?	?	?	L	
T	Quercus ilex	holly oak	L	L	L	L	M	M	
T	Quercus kelloggii	California black oak	L	M	/	M	/	/	
T	Quercus lobata	valley oak	L	L	/	M	/	/	
T	Quercus muhlenbergii	chinquapin oak	L	?	?	L	L	M	
T	Quercus palustris	pin oak	M	M	M	M	/	/	
T	Quercus robur	English oak	M	M	?	M	?	/	

			REGIONAL EVALUATIONS						
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T	Quercus rubra	red oak	M	M	/	M	/	/	
T	Quercus shumardii	Shumard red oak	M	M	?	/	/	/	
T	Quercus suber	cork oak	L	L	L	L	L	L	
T	Quercus texana	Spanish oak	L	?	?	L	L	M	
T	Quercus tomentella	island oak	L	?	L	/	/	/	
T	Quercus virginiana	southern live oak	M	M	M	M	M	M	
T	Quercus wislizeni	interior live oak	VL	VL	VL	VL	M	/	
T	Quillaja saponaria	soapbark tree	VL	L	L	?	?	?	
T	Radermachera sinica	Asian bell flower	/	/	M	/	/	/	
P	Ranunculus californicus	California buttercup	VL	VL	VL	VL	?	?	
P	Ranunculus cortusaefolius	buttercup	L	?	L	?	?	?	
P	Ranunculus repens	creeping buttercup	H	M	L	?	?	?	
P	Raoulia australis	golden scabweed	L	/	/	?	?	?	
P	Ratibida columnifera	Mexican hat	M	?	L	?	?	?	
T	Ravanea rivularis	ravanea	/	/	M	M	/	/	
P	Rehmannia elata	Chinese foxglove	H	H	M	H	M	M	
P	Reineckia carnea	reineckia	M	?	?	?	?	?	
Gc	Rhagodia deltophylla	rhagodia	L	?	VL	?	?	?	
S	Rhamnus alaternus	Italian buckthorn	L	L	L	M	/	/	
S	Rhamnus californicus	coffeeberry	L	L	VL	L	/	M	
S	Rhamnus croceus	redberry	L	L	VL	L	/	M	
S	Rhamnus croceus ilicifolia	hollyleaf redberry	L	L	VL	L	/	M	
S	Rhaphiolepis indica	Indian hawthorne	L	L	M	M	M	M	
T	Rhaphiolepis 'Majestic Beauty'	majestic beauty	L	L	M	M	M	M	
S	Rhaphiolepis umbellata	Yeddo hawthorne	L	L	M	M	?	?	
S	Rhapis excelsa	lady palm	/	/	M	M	/	/	
S	Rhododendron spp.	azalea	M	M	H	H	/	/	
S	Rhododendron spp.	rhododendron	M	M	H	H	/	/	
P	Rhodohypoxis spp.	rose grass	M	?	L	?	?	?	
P	Rhodophiala bifida	rhodophiala	L	?	?	?	?	?	
V	Rhoicissus capensis	evergreen grape	M	/	M	M	/	M	
T S	Rhopalostylis baueri	Norfolk palm	?	/	M	M	/	/	
T S	Rhopalostylis sapida	Nikau palm	?	/	H	H	/	/	
S Gc	Rhus aromatica	fragrant sumac	?	?	?	?	?	?	
S	Rhus choriophylla	evergreen sumac	?	?	?	?	?	?	
S	Rhus integrifolia	lemonade berry	L	L	VL	L	/	/	
T	Rhus lancea	African sumac	L	L	L	L	M	M	
T	Rhus lanceolata	prairie flameleaf sumac	?	?	?	?	L	L	
	Rhus laurina (see Malosma laurina)								
S	Rhus lentii	pink-flowering sumac	/	?	L	?	?	?	
S	Rhus microphylla	littleaf sumac	?	?	?	?	?	?	
S	Rhus ovata	sugar bush	L	L	VL	L	M	M	
S	Rhus trilobata	squawbush	L	L	L	L	L	/	
S T	Rhus typhina	staghorn sumac	L	L	L	?	L	/	
S	Rhus virens	evergreen sumac	?	?	?	?	?	?	
S	Rhynchelytrum neriglume	ruby grass	?	?	?	?	?	?	
S	Ribes aureum	golden currant	L	L	L	L	L	/	
S	Ribes indecorum	white flowering currant	L	L	L	L	L	/	
S	Ribes malvaceum	chaparral currant	VL	VL	VL	L	/	/	
S	Ribes sanguineum	red flowering currant	L	L	L	M	/	/	
S	Ribes speciosum	fuchsia flowering gooseberry	L	L	L	M	/	/	
S	Ribes thacherianum	Santa Cruz Island gooseberry	/	?	M	?	?	?	
S Gc	Ribes viburnifolium	evergreen currant	L	L	L	M	/	/	
T	Robinia X ambigua	locust	L	L	L	L	M	M	
T	Robinia pseudoacacia	black locust	L	L	L	L	L	L	☹
P	Rodgersia aesculifolia	rogersia (aesculifolia)	M	?	?	?	?	?	
P	Rodgersia pinnata	rogersia (pinnata)	M	?	?	?	?	?	
P	Rohdea japonica	rohdea	L	M	M	M	?	?	
S P	Romneya coulteri	Matilija poppy	VL	VL	VL	L	/	/	
V	Rosa banksiae	Lady Banks rose	L	L	M	M	M	M	
S	Rosa californica	California wild rose	L	L	L	L	/	/	

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TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
V	Rosa 'Cecile Brunner'	Cecile Brunner rose	L	L	M	M	M	M	
S	Rosa hybrids..bush	rose	M	M	M	M	H	H	
V	Rosa hybrids..climbing	climbing roses	M	M	M	M	H	H	
S	Rosa minutifolia	Baja California wild rose	L	?	L	?	M	?	
S	Rosa rugosa	Japanese rose	L	M	M	?	M	M	
S	Rosa woodsii var. ultramontana	mountain wood rose	M	?	?	?	M	?	
P	Roscoea purpurea	roscoea	M	?	?	?	?	?	
S P	Rosmarinus officinalis	rosemary	L	L	L	L	M	M	
P Gc	Rosemarinus 'Prostratus'	trailing rosemary	L	L	L	L	M	M	
S	Rubus lineatus	bramble (lineatus)	M	?	?	?	?	?	
S	Rubus pentalobus (calcynioides)	bramble	M	M	M	/	/	/	
S	Rubus ursinus	California blackberry	L	L	M	?	?	?	
P	Rudbeckia spp.	coneflower	M	M	M	M	?	?	
S	Ruellia X brittoniana	dwarf ruellia	M	?	L	?	M	L	
S	Ruellia californica	rama parda	?	?	VL	VL	/	L	
S	Ruellia macrantha	Christmas pride	M	/	M	?	?	?	
S	Ruellia peninsularis	Baja ruellia	/	?	M	M	/	M	
P	Rumohra adiantiformis	leather leaf fern	M	M	M	M	/	/	
P	Ruscus spp.	butcher's broom	L	L	L	?	?	?	
T	Sabal spp.	palmetto	/	/	M	M	/	/	
Gc P	Sagina subulata	Irish moss	M	M	M	H	H	H	
Gc P	Sagina subulata 'Aurea'	Scotch moss	M	M	M	H	H	H	
T S	Salix spp.	willow	H	H	H	H	H	H	
S	Salvia apiana	white sage	VL	L	VL	VL	L	L	
S	Salvia argentea	silver sage	L	L	L	L	?	?	
P	Salvia azurea grandiflora	prairie sage	M	M	L	?	?	?	
P	Salvia 'Bee's Bliss'	bee's bliss sage	L	?	L	?	L	?	
P	Salvia blepharophylla	eyelash-leafed sage	M	?	M	?	?	?	
P	Salvia buchananii	Buchanan's sage	M	?	M	M	?	?	
P	Salvia cacaliaefolia	Guatemalan blue sage	M	?	M	M	?	?	
P	Salvia californica	Baja California sage	/	?	VL	VL	?	?	
P	Salvia chamaedryoides	blue sage	L	L	L	L	M	M	
P	Salvia chiapensis	Chiapas sage	M	?	M	M	?	?	
S	Salvia clevelandii & hybrids	Cleveland/Alan Chickering etc.	L	L	VL	L	L	L	
S P	Salvia coahuilensis	Coahuila sage	L	?	L	?	?	?	
P	Salvia coccinea	Texas sage	L	M	M	M	M	M	
P S	Salvia confertiflora	spike sage	M	?	M	?	?	?	
S	Salvia 'Costa Rica Blue'	Costa Rica blue sage	M	?	M	?	?	?	
P	Salvia 'Dara's Choice'	Sonoma sage	L	L	L	L	L	L	
P S	Salvia darcyi	Darcy sage	M	?	?	?	?	?	
P	Salvia discolor	Andean silver leaf sage	M	/	?	?	?	?	
P	Salvia dorisiana	grapefruit-scented sage	M	?	M	?	?	?	
P	Salvia dorrii	purple sage	/	M	L	?	L	L	
P S	Salvia elegans	pineapple sage	M	M	M	M	?	?	
P	Salvia farinacea	nealy cup sage	M	M	M	M	/	M	
P	Salvia 'Firescape'	Firescape sage	?	?	?	?	?	?	
P	Salvia forskaohlei (hians)	sage (forskaohlei/hians)	M	?	?	?	?	?	
P S	Salvia fulgens	Mexican cardinal sage	M	?	M	?	?	?	
P S	Salvia gesneriflora	scarlet sage	M	?	M	?	?	?	
P	Salvia glechomaefolia	sage (glechomaefolia)	M	?	?	?	?	?	
	Salvia grahamii (See S. microphylla)								
S	Salvia greggii & hybrids	autumn sage	L	L	L	L	M	M	
P S	Salvia guarantica	anise scented sage	M	/	?	?	?	?	
	Salvia hians (See S. forskaohlei)								
P S	Salvia involucrata	roseleaf sage	M	?	M	?	?	?	
S	Salvia iodantha	sage (iodantha)	M	?	M	?	?	?	
S	Salvia X jamensis cvs.	sage (jamensis cvs.)	L	?	?	?	?	?	
S	Salvia karwinskii	Karwinski's sage	M	?	?	?	?	?	
P	Salvia koyamae	maniko	M	?	?	?	?	?	
S P	Salvia leucantha	Mexican bush sage	L	L	L	L	/	M	
S	Salvia leucophylla	purple sage	L	/	L	L	/	M	

			REGIONAL EVALUATIONS						
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P S	Salvia madrensis	forsythia sage	M	?	?	?	?	?	
P	Salvia 'Maraschino'	maraschino sage	M	?	M	?	?	?	
P	Salvia 'Mrs. Beard'	Mrs. Beard sage	?	?	M	?	?	?	
S	Salvia mellifera	black/green sage	L	L	L	L	/	M	
S	Salvia mexicana	Mexican sage	M	/	M	?	?	?	
S	Salvia microphylla	cherry/Graham sage	?	M	L	M	L	L	
P S	Salvia muelleri	royal purple autumn sage	L	M	L	?	M	M	
	Salvia muirii		?	?	?	?	?	?	
S	Salvia munzii	San Miguel Mountain sage	L	?	VL	L	L	/	
P S	Salvia officinalis	garden/kitchen sage	L	M	M	M	M	M	
P	Salvia patens	gentian sage	M	M	M	?	?	?	
P	Salvia pratensis haematodes	medow sage	M	M	?	?	?	?	
S	Salvia penstemonoides	big red sage	M	?	?	?	?	?	
S	Salvia 'Purple Majesty'	purple magesty sage	M	M	M	?	?	?	
S	Salvia regla	mountain sage	L	?	M	?	?	?	
P	Salvia reptans	sage (reptans)	L	?	?	?	?	?	
P	Salvia roemeriana	cedar sage	M	?	?	?	?	?	
P	Salvia sinaloensis	Sinaloan blue sage	M	?	M	?	?	?	
P	Salvia sonomensis	creeping/Sonoma sage	L	?	?	?	?	?	
P S	Salvia spathacea	hummingbird/pitcher sage	L	?	L	?	?	?	
P	Salvia X superba hybrids & cvs.	sage (superba)	M	M	M	?	?	?	
P	Salvia thymoides	blue salvia	L	?	L	?	?	?	
P	Salvia uliginosa	bog sage	M	M	M	?	/	/	
P	Salvia verticillata 'Purple Rain'	purple rain sage	M	?	?	M	?	?	
P S	Salvia 'Waverly'	Waverly sage	M	?	M	?	?	?	
T S	Sambucus spp.	elderberry	L	L	L	L	M	M	
S P	Santolina spp.	lavender cotton	L	L	L	L	L	L	
T	Sapium sebiferum	Chinese tallow tree	M	M	M	M	/	/	☹
Gc P	Saponaria ocymoides	rock soapwort	L	L	M	M	/	/	
S	Sarcococca confusa	sweet box	L	M	M	?	/	/	
S Gc	Sarcococca hookerana humilis	sweet sarcococca	L	M	M	M	/	/	
S	Sarcococca ruscifolia	fragrant sarcococca	L	M	M	M	/	/	
S	Sasa spp.	bamboo (Sasa)	L	L	M	M	/	M	
S Gc	Sasaella masamuniana albostriata	white striped dwarf bamboo	M	?	M	?	?	?	
P	Satureja chandleri	San Miguel savory	L	?	?	?	?	?	
P	Satureja douglasii	yerba buena	L	?	M	?	?	?	
P	Satureja mexicana	savory	L	?	?	?	?	?	
P	Saxifraga spp.	saxifrage	M	M	M	H	H	H	
P	Scabiosa spp.	pincushion flower	M	M	M	M	M	M	
Gc P	Scaevola aemula 'Diamond Head'	blue wonder	L	L	M	M	/	/	
Gc P	Scaevola 'Mauve Clusters'	fan flower	L	L	M	M	/	/	
S	Schlefflera actinophylla (Brassaia)	Queensland umbrella tree	/	/	M	/	/	M	
S	Schefflera arboricola	Hawaiian elf schefflera	/	/	H	H	/	H	
S	Schefflera elegantissima (Dizygotheca)	thread leaf false aralia	M	M	M	M	/	M	
T S	Schefflera pueckleri (Tupidanthus)	Australian umbrella tree	/	/	M	H	/	H	
T	Schinus molle	California pepper tree	VL	L	VL	L	M	M	☹
T	Schinus polygamous	Peruvian pepper tree	VL	L	L	L	L	M	
T	Schinus terebinthefolius	Brazilian pepper tree	M	M	M	M	/	M	☹
P	Schizostylis coccinia	Kaffir lily	M	M	M	M	/	M	
P	Schoenoplectus lacustris var.tabernaemontani	zebra rush	M	?	H	H	?	?	
T	Schotia latifolia	forest Boer bloom	?	?	M	?	?	?	
T	Sciadopitys verticillata	Japanese umbrella pine	M	?	M	/	/	/	
P	Scilla hughii	bluebell	VL	VL	?	?	?	?	
P	Scilla peruviana	Peruvian lily	VL	VL	M	M	?	?	
	Scirpus cernuus (See Isolepis cernua)								
P Gc	Sedum spp.	stone crop	L	L	L	L	L	L	
P	Selliera radicans	swamp weed	M	?	M	?	?	?	
P	Semiaquilegia ecalcarata	semiaquilegia	H	?	M	?	?	?	

			REGIONAL EVALUATIONS						
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P S	Semiarundinaria fastuosa	Narihira bamboo	M	?	M	M	?	M	
P	Sempervivum spp.	house leek	L	L	L	L	/	L	
P	Senecio cineraria	dusty miller	L	L	L	L	/	M	
	Senecio confusus (See Pseudogynoxys chenopodiodes)								
S	Senecio flaccidus var. douglasii	bush groundsel	VL	?	L	L	/	M	
	Senecio greyi (See Brachyglottis greyi)								
Gc	Senecio mandraliscae	kleinia	/	/	L	M	/	M	
S	Senna australis (Cassia australis)	Australian senna/cassia							
S	Senna artemesioides (Cassia artemesioides)	feathery cassia/senna	L	L	L	L	L	L	
S	Senna bicapsularis (Cassia candolleana)	New Zealand cassia/senna	L	L	L	/	/	L	
S	Senna didymobotrya (Cassia didymobotrya)	senna/cassia didymobotrya	?	?	L	?	?	?	
S	Senna lindheimeriana (Cassia lindheimeriana)	Lindheim's senna/cassia							
S	Senna multiglandulosa (Cassia tomentosa)	wooly senna	VL	/	L	?	/	M	
S	Senna odorata (Cassia odorata)	senna/cassia (odorata)	?	?	L	L	/	L	
S	Senna polyantha (Cassia goldmanii)	Goldman's senna/cassia	?	?	L	?	?	?	
S	Senna phyllodenia (Cassia phyllodenia)	silver cassia/senna	?	?	L	L	L	L	
S	Senna spectabilis (Cassia excelsa)	senna/cassia (spectabilis/excelsa)	?	?	L	L	?	?	
S	Senna splendida (Cassia splendida)	golden wonder	?	?	L	?	?	?	
S	Senna sturtii (Cassia sturtii)	Sturt's cassia/senna	/	/	L	L	L	L	
T	Sequoia sempervirens	coast redwood	H	H	H	H	/	/	
T	Sequoiadendron giganteum	giant sequoia	M	M	/	M	/	/	
S	Serissa foetida	serissa	M	/	M	M	?	?	
P	Sesleria spp.	moor grass	M	?	M	?	/	/	
P	Setaria palmifolia	palm grass	H	?	M	M	?	?	☹
P	Setcreasea pallida 'Purple Heart'	purple heart setcreasea	/	/	M	M	H	H	
S	Shepherdia argentea	silver buffaloberry	L	?	VL	VL	?	?	
P Gc	Shibatea kumasasa	Okame-Zaza bamboo	M	?	M	?	?	?	
P	Sidalcea spp.	false mallow	M	M	M	?	?	?	
P	Sideritis syriaca	sideritis	L	?	?	?	?		
P	Silene spp.	moss pink/campion	M	M	L	L	?	M	
S	Simmondsia chinensis	jojoba	VL	VL	VL	VL	L	L	
S	Sinarundinaria nitida (Fargesia nitida)	blue fountain bamboo	M	?	?	?	?	?	
P	Sinningia tubiflora	velvet slipper			L	?	?	?	
P	Sisyrinchium bellum	blue-eyed grass	VL	VL	L	L	M	M	
P	Sisyrinchium californicum	golden-eyed grass	M	M	M	M	M	M	
P	Sisyrinchium convolutum	sisysrinchium (convolutum)	H	?	?	?	?	?	
P	Sisysrinchium striatum	sisysrinchium (striatum)	M	?	M	?	/	/	
S	Skimmia japonica	Japanese skimmia	M	M	/	/	/	/	
S	Skimmia reevesiana	Reeves skimmia	?	?	/	/	/	/	
V	Solandra maxima	cup of gold vine	M	M	M	M	/	/	
S	Solanum aviculaare	kangaroo apple	L	?	?	?	?	?	
V S	Solanum crispum	Chilean potato tree	M	?	?	?	?	?	
V	Solanum jasminoides	potato vine	M	M	M	M	/	M	
V	Solanum wendlandii	Costa Rican nightshade	L	/	M	/	/	M	
V	Solanum xantii	purple nightshade	L	L	L	L	/	L	
Gc P	Soleirolia soleirolii	baby's tears	H	H	H	H	/	H	
S Gc	Sollya heterophylla	Australian bluebell creeper	L	L	L	L	/	/	
V	Sollya parvifolia	vining bluebell	?	?	?	?	?	?	
T	Sophora japonica	Japanese pagoda tree	L	L	M	M	M	M	
T S	Sophora secundiflora	Texas mountain laurel	L	L	L	L	M	M	
T	Sorbus aucuparia	European mountain ash	/	M	/	/	M	/	

			REGIONAL EVALUATIONS						
TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
T	Sorbus hupehensis	mountain ash	?	?	/	/	?	/	
T	Sparmannia africana	African linden	H	/	M	?	/	?	
S	Spartium junceum	Spanish broom	VL	VL	VL	L	VL	/	☹
P	Spathiphyllum spp.	spathiphyllum	/	/	H	/	/	/	
T	Spathodea campanulata	African tulip tree	/	/	M	/	/	/	
P	Sphaeralcea spp.	desert/globe mallow	L	L	L	L	/	L	
S	Spiraea spp.	spiraea	M	M	M	M	M	M	
P	Sporobolus airoides	alkalai dropseed	L	?	?	?	?	L	
P	Sprekelia formosissima	Aztec lily	L	L	L	L	L	L	
P	Stachys albotomentosa	betony	?	?	L	?	?	?	
P	Stachys byzantina	lamb's ears	L	L	M	M	/	M	
T	Stenocarpus sinuatus	firewheel tree	/	/	M	M	/	/	
P	Stenocereus thurberi (Lemaireocereus)	organ pipe cactus	/	/	VL	L	/	L	
P	Stenomesson variegatum	stenomesson	M	?	?	?	?	?	
V	Stephanotis floribunda	Madagascar jasmine	/	/	M	M	/	M	
T	Stewartia pseudocamellia	Japanese stewartia	M	/	/	/	/	/	
V	Stigmaphyllon ciliatum	butterfly vine	M	/	M	?	?	?	
P	Stipa cernua	nodding feather grass	VL	?	L	L	L	L	
P	Stipa gigantea	giant needle grass	M	?	L	L	L	L	
P	Stipa lepida	foothill stipa	VL	VL	L	L	L	L	
P	Stipa pulchra	feather grass	VL	L	VL	L	L	L	
P	Stipa stipa spinosa	desert bunch grass	?	?	L	L	L	L	
P	Stipa tenuissima	Mexican feather grass	L	?	L	L	L	L	
P	Stokesia laevis	stokes aster	M	M	M	M	M	M	
T	Strelitzia nicolai	giant bird of paradise	M	/	M	M	/	M	
S	Strelitzia reginae	bird of paradise	M	M	M	M	/	M	
S	Streptosolen jamesonii	marmalade bush	/	/	M	H	/	/	
T	Styrax japonicum	Japanese snowbell	M	M	/	/	M	/	
S	Styrax officinale californicum	California storax	L	L	L	L	M	/	
S	Styrax officinale redivivus	snowdrop bush	L	L	/	?	?	/	
P S	Sutera spp.	sutera	M	?	L	?	?	?	
S	Swainsonia galegifolia	winter sweet pea	M	?	?	?	?	?	
T	Syagrus romanzoffiana	queen palm	L	M	M	M	M	M	
S	Symphoricarpus albus	snowberry	L	L	L	L	?	/	
S	Symphoricarpus orbiculatus	coralberry	M	?	?	?	?	/	
S	Symphoricarpus mollis	creeping snowberry	L	L	?	?	?	/	
S	Symphyandra spp.	ring bellflower	M	?	M	?	?	?	
S	Syringa X chinensis	Chinese lilac	M	M	/	?	?	/	
S	Syringa X hyacinthiflora	Canadian lilac	M	M	/	?	?	/	
S	Syringa patula	Korean lilac	M	M	/	?	?	/	
S	Syringa X persica	Persian lilac	L	L	/	?	M	/	
S	Syringa vulgaris	lilac	L	L	/	M	M	/	
S	Syzygium paniculatum	Australian brush cherry	M	M	M	M	/	/	
S	Syzygium smithii	Smith's brush cherry	?	?	M	M	/	?	
S	Tabebuia chrysotricha	golden trumpet tree	?	/	M	M	/	M	
T	Tabebuia impetiginosa (ipe)	pink/lavender trumpet tree	/	/	M	M	/	/	
T	Tagetes lemmoni	mountain marigold	L	L	L	L	M	M	
S P	Tagetes lucida	Mexican tarragon	M	M	M	M	M	M	
P	Talinium calcynium	flame flower	L	?	?	?	?	?	
P	Tamarix spp.	tamarisk	VL	VL	L	L	L	L	☹ ☹
T S	Tanacetum coccinium (Pyrethrum roseum)	painted daisy	M	/	L	?	?	?	
P	Tanacetum haradjanii	tansy	L	?	L	?	?	?	
	Tanacetum herderi (See Hippolyta herderi)								
P	Tanacetum parthenium (Chrysanthemum parthenium)	feverfew	L	L	M	M	M	M	
T	Taxodium distichum	bald cypress	M	M	M	M	/	/	
T	Taxodium mucronatum	Montezuma cypress	M	M	M	M	/	/	
T S	Taxus baccata	English yew	M	M	M	M	M	/	

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T S	Taxus baccata 'Fastigiata'	Irish yew	M	M	M	M	M	/	
S	Taxus cuspidata	Japanese yew	M	?	M	?	?	?	
S	Taxus 'Meyeri'	Meyer's Yew	M	?	?	?	?	?	
S	Taxus X media cvs.	Yew (media cvs.)	M	?	M	?	?	?	
S	Tecoma 'Orange Jubilee'	orange jubilee tecoma	M	M	?	?	/	M	
S T	Tecoma X smithii	Smith's tecoma	?	?	M	?	?	?	
T S	Tecoma stans	yellow bells	/	/	L	L	/	L	
V	Tecomanthe speciosa	tecomanthe	M	?	?	?	?	?	
S V	Tecomaria capensis	cape honeysuckle	M	M	M	M	/	M	
P	Tellima grandiflora	fringe cups	M	?	?	?	?	?	
P	Telopea speciosissima	waratah	M	/	?	?	?	?	
S	Ternstroemia gymnanthera	Japanese ternstroemia	M	M	M	M	M	/	
S	Tetraneuris acaulis (Hymenoxis acaulis)	sweet shade	?	?	?	?	/	M	
S	Tephrosia grandiflora	hoary pea	M	?	?	?	?	?	
V	Tetrapanax papyrifer	rice paper plant	L	M	M	M	/	M	
Gc	Tetrastigma voinieranum	Javan grape	/	/	M	M	/	M	
P Gc	Teucrium chamaedrys	germander	L	L	L	L	M	M	
S Gc	Teucrium cossonii	Majorcan germander	VL	L	L	L	/	L	
S	Teucrium fruticans	bush germander	L	L	L	L	/	M	
P	Teucrium hyrcanicum	germander (hyrcanicum)	L	?	?	?	?	?	
S	Teucrium marum	cat thyme	L	L	L	L	?	?	
P S	Teucrium scorodonia 'Crispum'	germander (crispum)	M	?	M	?	?	?	
P	Thalictrum aquilegifolium	purple meadow rue	H	?	M	?	?	?	
P	Thalictrum coreanum	meadow rue (coreanum)	M	?	?	?	?	?	
P	Thalictrum delavayi	lavender shower	H	?	M	M	?	?	
P	Thalictrum fendleri var. polycarpum	meadow rue	M	?	L	L	?	?	
P	Thalictrum flavum spp glaucum	meadow rue (flavum)	H	?	M	?	?	?	
P	Thalictrum dipterocarpum (See T. delavayi)		H	?	?	?	?	?	
P	Thalictrum polycarpum	medow rue	M	?	M	M	M	M	
P	Thalictrum rochenbrunianum	lavender mist	H	?	?	?	?	?	
	Thalictrum speiosissimum (See T. flavum spp glaucum)								
P	Thamnocalamus spathaceus (Fargesia murieliae)	umbrella bamboo	M	?	M	M	?	?	
T S	Thevetia peruviana	yellow oleander	/	/	M	M	/	M	
T	Thevetia thevetioides	giant thevetia	/	/	M	M	/	M	
S	Thuja occidentalis	American arborvitae	M	M	M	M	M	M	
S	Thuja orientalis (See Platycadus orientalis)								
V	Thunbergia alata	black eyed susan	M	M	M	M	M	M	
V	Thunbergia battiscombei	thunbergia (battiscombei)	M	?	M	M	M	M	
V	Thunbergia grandiflora	sky flower	M	/	M	/	/	M	
V	Thunbergia gregorii	orange clock vine	M	/	M	M	/	M	
V	Thunbergia mysorensis	thumbergia (mysorensis)	M	?	M	/	/	/	
GC P	Thymus spp.	thyme	M	M	M	M	M	M	
P	Thysanolaena maxima	tiger grass	?	?	M	M	?	?	
S	Tiarella wherryi	sugar scoop	M	/	M	?	M	?	
S	Tibuchina heteromalla	glory bush	M	/	M	?	/	/	
S	Tibuchina urvilleana (semidecandra)	princess flower	M	/	M	H	/	H	
T	Tilia americana	American linden	M	M	/	/	/	/	
T	Tilia cordata	little leaf linden	M	M	/	/	/	/	
T	Tipuana tipu	tipu tree	M	/	M	M	/	/	
P	Todea barbara	crepe fern	M	?	M	?	?	?	
T	Toona sinensis (Cedrela sinensis)	Chinese toon	?	?	L	?	?	?	
P	Trachelium caeruleum	throatwart	M	?	M	?	?	?	
Gc V	Trachelospermum asiaticum	Asian star jasmine	M	M	M	M	M	M	
S Gc	Trachelospermum jasminoides	star jasmine	M	M	M	M	M	M	
T	Trachycarpus fortunei	windmill palm	L	M	M	M	/	M	
T	Trachycarpus takil	takil fan palm	?	/	M	M	/	M	

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TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
P	Tradescantia X andersoniana	spiderwort	M	M	M	M	M	M	
P	Tradescantia fluminensis	wandering Jew	M	/	M	?	?	?	
P	Tradescantia pallida	spiderwort	M	?	M	?	?	?	
	Trichocereus spp. (See Echinopsis spp.)								
S P	Trichostema lanatum	woolly/mountain blue curls	VL	VL	VL	L	/	M	
	Trichostema parishii (See T. lanatum)					/			
P	Tricyrtis hirta	toad lily	M	?	L	?	?	?	
Gc	Trifolium fragiferum O'Connor	O'Connors legume (landscape use)	M	M	M	M	M	M	
Gc	Trifolium fragiferum O'Connor	O'Conners legume (revegetation use)	L	L	L	L	L	L	
Gc	Trifolium repens	white clover	M	/	H	H	?	?	
	Tristania conferta (See Lophostemon confertus)								
	Tristania laurina (See Tristaniopsis laurina)								
T	Tristaniopsis laurina	little leaf myrtle	M	/	M	M	/	/	
P	Tritelia laxa	Ithuriel's spear	Vl	VL	L	L	?	?	
P	Tritonia spp.	tritonia							
S	Trixis californica	trixis	?	?	?	?	L	M	
P	Trollius spp.	globeflower	H	H	M	M	H	H	
P	Tropaeolum majus	nasturtium	M	M	/	M	/	M	☹
T	Tsuga canadensis	Canadian hemlock	M	/	/	/	/	/	
P	Tulbaghia fragrans	sweet garlic	M	M	M	M	/	M	
P	Tulbaghia violacea	society garlic	M	M	M	M	/	M	
	Tupidanthus calyptratus (See Schefflera pueckleri)								
P	Tweedia caesulea (Oxypetalum caeruleum)	blue flowered milkweed	M	?	M	?	?	?	
S	Ugni molinae	Chilean guava	M	M	M	M	?	?	
S T	Ungnadia speciosa	Mexican buckeye	?	?	?	?	L	M	
T	Ulmus americana	American elm	M	M	M	M	?	/	
T	Ulmus glabra	Scotch elm	M	?	?	?	?	?	
T	Ulmus parvifolia	Chinese evergreen elm	M	M	M	M	M	M	
T	Ulmus pumila	Siberian elm	L	L	/	L	M	M	
T	Umbellularia californica	California bay	M	M	M	M	/	/	
P	Urginea maritima	sea squill	L	?	L	?	/	/	
S	Vaccinium moupinense	Himalayan blueberry	M	?	?	?	/	/	
S	Vaccinium ovatum	evergreen huckleberry	M	M	/	/	/	/	
S	Vaccinium parvifolium	red huckleberry	M	M	/	/	/	/	
S	Vaccinium vitis-idaea	foxberry	M	?	/	/	/	/	
P Gc	Vancouveria spp.	inside-out flower	M	?	?	?	?	?	
S	Vauquelinia californica	Arizona rosewood	L	?	/	/	M	M	
S	Vauquelinia corymbosa var. heterodon	narrow leaf rosewood	?	?	/	/	?	L	
P	Velthemia bracteata	forest lily	L	?	M	/	?	?	
P	Verbascum bombiciferum	mullein	M	?	L	?	?	?	
P	Verbascum phoeniceum	purple mullein	L	L	L	L	/	/	
P	Verbena bonariensis	verbena (bonariensis)	VL	M	L	L	M	M	
Gc P	Verbena gooddingii	Goodding verbena	L	L	L	L	/	M	
P	Verbena hybrids	garden verbena	L	L	M	M	/	M	
Gc P	Verbena lilacina	lilac verbena	L	?	L	L	/	L	
Gc	Verbena peruviana	Peruvian verbena	L	L	L	L	/	M	
Gc P	Verbena rigida	vervian	M	M	M	M	/	M	
Gc	Verbena stricta	hoary vervian	L	M	M	M	M	M	
Gc	Verbena tenera (pulchella)	rock verbena	M	?	?	M	M	M	
Gc	Verbena tenuisecta	moss verbena	L	L	L	L	/	M	
P	Veronica spp.	veronica	M	M	M	/	/	M	
Gc	Veronica repens	speedwell	M	M	M	/	/	/	

			REGIONAL EVALUATIONS						
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P	Veronicastrum virginicum	blackroot	M	?	?	?	?	?	
S	Viburnum 'Anne Russel'	Anne Russel viburnum	M	?	?	?	?	?	
S	Viburnum awabuki	awabuki viburnum	M	?	M	?	?	?	
S	Viburnum X bodnantense	Bodnant viburnum	M	?	?	?	?	?	
S	Viburnum X burkwoodii	Burkwood viburnum	L	M	M	/	M	/	
S	Viburnum carlesii	Korean spice viburnum	M	?	?	?	?	?	
S	Viburnum carlesii cvs.	Cayuga,Chesapeake, Eskimo Viburnum	M	?	?	?	?	?	
S	Viburnum davidii	David viburnum	M	M	/	/	/	/	
S	Viburnum japonicum	Japanese viburnum	M	M	M	M	M	/	
S	Viburnum 'Mohawk'	Mohawk viburnum	M	?	?	?	?	?	
S	Viburnum odoratissimum	sweet viburnum	L	M	M	/	M	/	
S	Viburnum opulus	European cranberry bush	L	M	M	M	M	/	
S	Viburnum plicatum tomentosum	doublefile viburnum	M	M	M	M	?	/	
S	Viburnum X pragense	Prague viburnum	?	?	?	?	?	?	
S	Viburnum X rhytidophylloides	viburnum (rhytidophylloides)	M	?	?	?	?	?	
S	Viburnum rhytidophyllum	leatherleaf viburnum	M	M	M	M	M	M	
S	Viburnum setigerum	tea viburnum	?	?	M	?	?	?	
S	Viburnum suspensum	sandanqua viburnum	M	M	M	M	M	M	
S	Viburnum tinus	laurustinus	M	M	M	M	M	M	
S	Viburnum trilobum	American cranberry	M	?	?	?	?	?	
V	Vigna caracalla	snail vine	M	/	M	M	/	M	
S	Viguiera deltoidea	goldeneye	/	?	?	?	L	L	
S	Viguiera laciniata	San Diego County viguiera	/	?	VL	?	?	?	
T	Villebrunea pedunculata	villebrunea	?	?	M	?	?	?	
Gc	Vinca major	periwinkle	M	M	M	M	M	M	☹
Gc	Vinca minor	periwinkle	M	M	M	M	M	M	
P	Viola adunca	western dog violet	M	?	M	?	?	?	
P	Viola cornuta	horned violet	M	?	M	?	?	?	
P Gc	Viola hederacea	Australian violet	M	M	M	H	M	M	
P	Viola japonica	violet (japonica)	M	?	?	?	?	?	
P Gc	Viola labradorica	Labrador violet	M	M	M	H	H	H	
P Gc	Viola odorata	sweet violet	M	M	M	H	H	H	
P	Viola sempervirens	redwood violet	L	?	?	?	?	?	
T	Vitex agnus-castus	chaste tree	L	L	L	M	M	M	
V	Vitis californica	California wild grape	L	M	VL	L	M	M	
V	Vitis girdiana	desert grape	L	M	L	L	M	M	
V	Vitis labrusca	American grape	L	L	M	M	M	M	
V	Vitis vinifera	European grape	L	L	M	M	M	M	
P	Wachendorfia thrysiflora	red root	H	?	?	?	?	?	
P	Wahlenbergia gloriosa	royal bluebell	M	?	?	?	?	?	
T	Washingtonia filifera	California fan palm	L	M	L	L	M	M	
T	Washingtonia robusta	Mexican fan palm	L	M	L	L	M	M	
P	Watsonia spp.	watsonia	L	M	L	M	M	M	☹
P Gc	Wedelia trilobata	trailing daisy	?	?	H	/	/	?	
S	Weigela coraeensis	white weigela	?	?	M	?	?	?	
S	Weigela florida	weigelia	M	M	M	M	M	/	
S	Westringia fruiticosa (rosmariniformis)	coast rosemary	L	L	L	L	/	M	
S	Westringia glabra	violet westringia	L	?	L	?	/	M	
S	Westringia longifolia	westringia (longifolia)	L	?	L	?	/	M	
S	Westringia raleighi	Raleigh westringia	L	?	L	?	/	M	
S	Westringia 'Wynyabbie Gem'	Wynyabbie gem westringia	L	?	L	?	/	M	
V	Wisteria spp.	wisteria	M	M	M	M	M	M	
P	Woodwardia fimbriata	giant chain fern	M	M	M	M	/	/	
P	Woodwardia radicans	European chain fern	H	/	H	H	H	H	
P	Xanthorrhoea spp.	grass tree	L	/	L	L	?	?	
P	Xeronema calistemon	poor knight's lily	M	?	?	?	?	?	
P	Xerophyllum tenax	bear grass	L	?	?	?	?	?	
S P	Xylococcus bicolor	mission manzanita	?	?	VL	L	M	/	
S	Xylosma congestum	shiny xylosma	L	L	M	M	M	M	
S T	Yucca spp.	yucca	L	L	L	L	L	L	

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TYPE	BOTANICAL NAME	COMMON NAME	1	2	3	4	5	6	INVASIVE
P	Zaluzianskya katherinae	zaluzinskya	M	?	?	?	?	?	
S	Zamia pumila	Florida arrowroot	/	/	M	H	/	/	
P	Zantedeschia aethiopia	calla lily	M	M	M	M	/	M	☹
P	Zantedeschia spp. & hybrids	pink/yellow calla lily	M	M	M	M	/	M	
P	Zauschneria spp. (see Epilobium)								
T	Zelkova serrata	saw leaf zelkova	M	M	L	M	M	M	
P	Zephryranthes spp.	zephyr flower	M	M	M	M	/	M	
	Zephryanthes robusta (See Habranthus robustus)								
P	Zexmenia hispida	zexmenia	?	?	?	?	?	?	
GC P	Zinnia grandiflora	prairie zinnia	M	M	M	M	M	M	
T	Ziziphus jujuba	Chinese jujube	L	L	L	M	M	M	
T	Ziziphus obtusifolia	graythorn	/	?	?	?	?	?	
Gc P	Zoyzia tenuifolia	Mascarene grass	M	M	M	M	M	M	

COMMON NAME	BOTANICAL NAME
Aaron's beard	Hypericum calycinum
Abyssinian acacia	Acacia abyssinica
Abyssinian banana	Ensete ventricosum
African boxwood	Myrsine africana
African corn lily	Ixia spp.
African daisy	Arctotis hybrids
African daisy	Osteospermum spp.
African fern pine	Afrocarpus gracilior (Podocarpus gracilior)
African linden	Sparmannia africana
African plumbago	Ceratostigma abyssinicum
African sumac	Rhus lancea
African tulip tree	Spathodea campanulata
agapetes (serpens)	Agapetes serpens (Pentapetpterygium)
agave	Agave spp.
Alaskan fern	Polystichum X setigerum
Albany bottlebrush	Callistemon speciosus
Alberta spruce	Picea glauca
Albury purple hypericum	Hypericum X inodorum 'Albury Purple'
alectryon/titoki	Alectryon excelsus
Aleppo pine	Pinus halepensis
Algerian ivy	Hedera canariensis
'Alice Dupont' etc.	Mandevilla cvs.
alkalai dropseed	Sporobolus airoides
allium	Allium spp.
almond	Prunus spp. (edible)
aloe	Aloe spp.
aloysia	Aloysia machrostachya
alpine campion	Lychnis alpina
alpine geranium	Erodium reichardii
alpine totara	Podocarpus nivalis
alpine water fern	Blechnum penna-marina
alum root	Heuchera micrantha
amaryllis	Hippeastrum spp.
American arborvitae	Thuja occidentalis
American cranberry	Viburnum trilobum
American elm	Ulmus americana
American grape	Vitis labrusca
American linden	Tilia americana
American smoke tree	Cotinus obvatus
amur maple	Acer tataricum ssp. ginnala
Andean silver leaf sage	Salvia discolor
angel flower	Angelonia angustifolia
angel wing jasmine	Jasminum nitidum
angel's trumpet	Brugmansia spp.
anise scented sage	Salvia guarantica
Anne Russel viburnum	Viburnum 'Anne Russel'
Apache plume	Fallugia paradoxa
apple	Malus spp.(edible)
apricot	
Arabian jasmine	Jasminum sambac
Argentine mesquite	Prosopis alba
Arizona ash	Fraxinus velutina
Arizona mesquite	Prosopis juliflora
Arizona rosewood	Vauquelinia californica
Arizona sycamore	Platanus wrightii
Arizona walnut	Juglans major

COMMON NAME	BOTANICAL NAME
arnica	Arnica montana
arrow bamboo	Pseudosasa japonica
arroyo lupin	Lupinus sparsiflorus
ash leaved gum, silver dollar tree	Eucalyptus cinerea
ashy silktassel	Garrya flavescens
Asian bell flower	Radermachera sinica
Asian star jasmine	Trachelospermum asiaticum
Asphodel	Asphodeline taurica
astelia	Astelia nivicola
aster	Aster spp.
athanasia	Athanasia acerosa
Atlas cedar	Cedrus atlantica
Australia fountain palm	Livistona australis
Australian agathis/ kauri	Agathis australis
Australian blue grass	Poa costineata
Australian bluebell creeper	Sollya heterophylla
Australian brush cherry	Syzygium paniculatum
Australian fuchsia	Correa spp.
Australian heath	Epacris gunii
Australian pea	Dipogon lignosus
Australian senna/cassia	Senna australis (Cassia australis)
Australian tea tree	Leptospermum laevigatum
Australian tree fern	Cyathea cooperii
Australian umbrella tree	Schefflera pueckleri (Tupidanthus)
Australian violet	Viola hederacea
Australian willow	Geijera parviflora
Austrian black pine	Pinus nigra
autumn crocus	Colchicum agrippium
autumn sage	Salvia greggii & hybrids
avens	Geum spp.
avocado	Persea americana
awabuki viburnum	Viburnum awabuki
azalea	Rhododendron spp.
azara	Azara integrifolia
Aztec lily	Sprekelia formosissima
baboon flower	Babiana stricta hybrids
baby bonnets	Coursetia axillaris
baby's breath	Gypsophila cerastioides
baby's breath	Gypsophila paniculata
baby's tears	Soleirolia soleirolii
Bailey acacia	Acacia baileyana
Baja bush-snapdragon	Galvesia juncea
Baja California sage	Salvia californica
Baja California wild rose	Rosa minutifolia
Baja evening primrose	Oenothera stubbei
Baja fairy duster	Calliandra californica
Baja indigo bush	Dalea orcutii
Baja ruellia	Ruellia peninsularis
bald cypress	Taxodium distichum
balloon flower	Platycodon grandiflorus
balsam/balm of Gilead poplar	Populus balsamifera
bamboo	Chusquea coronalis
bamboo	Drepanostachyum hookerianum
bamboo (Bambusa)	Bambusa spp.
bamboo (Phylostachys)	Phyllostachys spp.
bamboo (Sasa)	Sasa spp.

COMMON NAME	BOTANICAL NAME
bamboo muhly	Muhlenbergia dumosa
banana	Musa spp.
banana-leaf fig	Ficus barteri
banana shrub	Michelia figo
barberry	Berberis spp.
barberry	Berberis X stenophylla 'Irwinii'
barleria	Barleria obtusa
barrel cactus	Echinocactus spp.
barrel cactus	Ferocactus spp.
bat-faced cuphea	Cuphea llavea
baumea	Baumea rubiginosa
bayberry	Myrica pennsylvanica
beach aster	Erigeron glaucus
beach evening primrose	Camissonia cherianthifolia (Oenothera)
beach pine	Pinus contorta
bear grass	Nolina spp.
bear grass	Xerophyllum tenax
bearded iris	Iris spp.
bear's breech	Acanthus mollis
beauty berry	Callicarpa bodinieri
beauty berry	Callicarpa japonica
beauty bush	Kolkwitzia amabalis
bee balm	Monarda didyma
bee's bliss sage	Salvia 'Bee's Bliss'
bell flower	Campanula spp.
bell mallee	Eucalyptus preissiana
bentennial baccharis	Baccharis 'Centennial'
betony	Stachys albotomentosa
big leaf maple	Acer macrophyllum
big red sage	Salvia penstemonoides
Bigelow sneezeweed	Helenium bigelovii
bird catcher tree	Pisonia umbellifera
bird of paradise	Strelitzia reginae
bird's eye bush	Ochna serrulata
bird's foot fern	Pellaea mucronata
bird's nest fern	Asplenium nidus
birdsfoot trefoil	Lotus corniculatus
bishop pine	Pinus muricata
bishop's hat	Epimedium grandiflorum
bitter root	Lewisia cotyledon
black alder	Alnus glutinosa
black box	Eucalyptus largiflorens
black bush	Corethrogyne californica
black coral pea	Kennedia nigricans
black cottonwood	Populus trichocarpa
black dalea	Dalea frutescens
black eyed susan	Thunbergia alata
black locust	Robinia pseudoacacia
black mondo grass	Ophiopogon planiscapus var. nigrescens
black pennisetum	Pennisetum alopecuroides
black spruce	Picea mariana
black tea	Melaleuca lanceolata
black/green sage	Salvia mellifera
blackfoot daisy	Melampodium leucanthum
blackroot	Veronicastrum virginicum
blackwood acacia	Acacia melanoxylon

COMMON NAME	BOTANICAL NAME
bladder pod	Cleome isomeris
blanket flower	Gaillardia grandiflora
bleeding heart	Dicentra spp.
blood red trumpet vine	Distictis buccinatoria
blue-eyed grass	Sisyrinchium bellum
blue bamboo	Drepanostachyum falcatum (Arundinaria)
blue bird hydrangea	Hydrangea serrata
blue boy/girl etc. cvs.	Ilex X meserveae
blue cape pea	Otholobium fruiticans
blue dawn flower	Ipomea indica (acuminata0
blue dracaena palm	Cordyline indivisa
blue fescue	Festuca glauca
blue flowered milkweed	Tweedia caesulea (Oxypetalum caeruleum)
blue fountain bamboo	Sinarundinaria nitida (Fargesia nitida)
blue ginger	Dichorisandra thyrsifolia
blue gramma	Bouteloua gracilis
blue gum	Eucalyptus globulus
blue hair grass	Koelaria glauca
blue hesper palm	Brahea armata
blue hibiscus	Alyogyne huegelii
blue leaf wattle	Acacia saligna
blue marguerite	Felicia amelloides
blue mist	Caryopteris X clandonensis
blue oak	Quercus douglasii
blue oat grass	Helictotrichon sempervirens
blue palo verde	Parkinsonia florida (Cercidium floridum)
blue pea	Psoralea pinnata
blue sage	Salvia chamaedryoides
blue salvia	Salvia thymoides
blue star creeper	Laurentia fluviatilis
blue wonder	Scaevola aemula 'Diamond Head'
bluebell	Scilla hughii
blueberry	Dianella tasmanica
blueberry creeper	Ampelopis brevipedunculata
Bodnant viburnum	Viburnum X bodnantense
bog rosemary	Andromeda polifolia
bog sage	Salvia uliginosa
bolleana poplar	Populus alba 'Pyramidalis'
book-leaf mallee	Eucalyptus kruseana
boronia	Boronia spp.
Bosnian pine	Pinus heldreichii
Boston fern	Nephrolepis exaltata
Boston ivy	Parthenocissus tricuspidata
bottle brush	Callistemon citrinus
bottle palm	Nolina recurvata (Beaucarnea recurvata)
bottle tree	Brachychiton populneus
bougainvillea	Bougainvillea spp.
bower vine	Pandorea jasminoides
bower wattle	Acacia cognata (A.subporosa)
Bowles mauve wallflower	Erysimum 'Bowles Mauve'
box-leaved holly	Ilex crenata
box elder	Acer negundo
box honeysuckle	Lonicera nitida
box leaf azara	Azara microphylla
boxthorn	Lycium exertum
bracelet honey-myrtle	Melaleuca armillaris

COMMON NAME	BOTANICAL NAME
brake fern	Pteris spp.
bramble	Rubus pentalobus (calcynioides)
bramble (lineatus)	Rubus lineatus
Brazilian butterfly tree	Bauhinia forficata
Brazilian pepper tree	Schinus terebinthefolius
Brazilian plume flower	Justicia carnea
Brazilian sky flower	Duranta stenostachya
breath of heaven	Coleonema pulchrum
bridal wreath	Deutzia spp.
bridal wreath	Francoa ramosa
bridal wreath	Francoa sonchifolia
Bridget bloom heucherella	X Heucherella tiarelloides 'Bridget Bloom'
brightness lobelia	Lobelia 'Brightness'
Brisbane box	Lophostemon confertus
brittle bush	Encelia farinosa
broad buckler fern	Dryopteris dilatata
brodiaea	Brodiaea spp.
bronze loquat	Eryobotrya deflexa
broom (Cytisus)	Cytisus spp.
broom (Genista)	Genista spp.
Buchanan's sage	Salvia buchananii
buckwheat	Eriogonum spp.
bulb oat grass	Arrhenatherum elatius ssp bulbosum
bulbinella	Bulbinella robusta
bull grass	Muhlenbergia emersleyi
bunchberry	Cornus canadensis
bunya-bunya	Araucaria bidwilii
Burford holly	Ilex cornuta 'Burfordii'
Burkwood daphne	Daphne X burkwoodii
Burkwood viburnum	Viburnum X burkwoodii
Burmese plumbago	Ceratostigma griffithii
burning bush	Euonymous alatus
burning bush/dittany	Dictamnus spp.
bursera	Bursera hindsiana
bush anemone	Carpenteria californica
bush germander	Teucrium fruticans
bush groundsel	Senecio flaccidus var. douglasii
bush mallow	Lavatera maritima
bush mallow	Malacothamnus fasciculatus
bush morning glory	Convolvulus cneorum
bush poppy	Dendromecon spp.
bushrue	Cneoridium dumosum
bushy clematis	Clematis integrifolia
bushy yate	Eucalyptus lehmannii
butcher's broom	Ruscus spp.
buttercup	Ranunculus cortusaefolius
butterfly bush	Buddleja davidii
butterfly bush	Clerodendrum ugandense
butterfly vine	Stigmaphyllon ciliatum
butterfly weed	Asclepias tuberosa
button fern	Pellaea rotundifolia
cadaga	Eucalyptus torelliana
cajeput tree	Melaleuca viridiflora var. rubiflora
Calabrian pine	Pinus brutia
calamint	Calamintha spp.
calico flower	Aristolochia elegans

COMMON NAME	BOTANICAL NAME
California bay	Umbellularia californica
California black oak	Quercus kelloggii
California black walnut	Juglans hindsii
California blackberry	Rubus ursinus
California buckeye	Aesculus californica
California buttercup	Ranunculus californicus
California Dutchman's pipe	Aristolochia californica
California encelia	Encelia californica
California fan palm	Washingtonia filifera
California fescue	Festuca californica
California fuchsia	Epilobium spp.(Zauchneria)
California holly grape	Mahonia pinnata & cvs.
California juniper	Juniperus californica
California lilac	Ceanothus spp.
California pepper tree	Schinus molle
California poppy	Eschscholzia californica
California privet	Ligustrum ovalifolium
California scrub oak	Quercus berberidifolia
California storax	Styrax officinale californicum
California sycamore	Platanus racemosa
California wild grape	Vitis californica
California wild rose	Rosa californica
calla lily	Zantedeschia aethiopia
Callery pear	Pyrus calleryana cultivars
callistemon (subulatus)	Callistemon subulatus
calyophus (drummondii)	Calyophus drummondii
camellia	Camellia japonica
camphor tree	Cinnamomum camphora
Canadian hemlock	Tsuga canadensis
Canadian lilac	Syringa X hyacinthiflora
canary-bird bush	Crotalaria agatiflora
Canary island daisy	Nauplius sericeus (Asteriscus sericeus)
Canary Island date palm	Phoenix canariensis
Canary Island pine	Pinus canariensis
Canary Island rose	Aeonium spp.
cane bluestem	Bothriochloa barbinoides
cane reed	Arundinaria gigantea
canna	Canna spp.
canyon live oak	Quercus chrysolepis
cape chestnut	Calodendrum capense
cape fuchsia	Phygelius X rectus
cape honeysuckle	Tecomaria capensis
cape plumbago	Plumbago auriculata (campense0
cape reed	Chondropetalum tectorum
Cape reed	Elegia capensis
cape tulip	Homeria spp.
cape weed	Arctotheca calendula
cape weed	Phyla nodiflora (Lippia nodiflora)
caper bush	Capparis spinosa
carob	Ceratonia siliqua
Carolina allspice	Calycanthus floridus
Carolina jessamine	Gelsemium sempervirens
Carolina laurel cherry	Prunus caroliniana
Carolina poplar	Populus X canadensis
carpet bugle	Ajuga reptans
Carribean copper plant	Euphorbia cotinifolia

COMMON NAME	BOTANICAL NAME
carrotwood	Cupaniopsis anacardioides
cascalote	Caesalpinea cacalaco
cashmere bouquet	Clerodendrum bungei
cast iron plant	Aspidistra elatior
cat thyme	Teucrium marum
Catalina cherry	Prunus lyonii
Catalina ironwood	Lyonothamnus floribundus
catclaw acacia	Acacia greggii
catmint/catnip	Nepeta spp.
cat's claw	Macfadyena unguis-cati
cautleya	Cautleya spicata
Cayuga,Chesapeake, Eskimo Viburnum	Viburnum carlesii cvs.
ceanothus	Ceanothus cultivars
Cecile Brunner rose	Rosa 'Cecile Brunner'
cedar of Lebanon	Cedrus libani
cedar sage	Salvia roemeriana
centaurea (rupestris)	Centaurea rupestris
central Australian fan palm	Livistona mariae
chalk buckwheat	Eriophyllum lanatum
chamaedorea	Chamaedorea spp.
chameleon houttuynia	Houttuynia cordata 'Chameleon'
chamise	Adenostoma fasciculatum
chamomile	Chamaemelum nobile
chaparral currant	Ribes malvaceum
chaparral honeysuckle	Lonicera subspicata
chasmanthe	Chasmanthe aethiopica
chaste tree	Vitex agnus-castus
cheese bush	Hymenoclea monogyra
chenile honey-myrtle	Melaleuca huegelii
cherimoya	Annona cherimola
cherry	Prunus spp. (edible)
cherry/Graham sage	Salvia microphylla
Chiapas sage	Salvia chiapensis
Chilean guava	Ugni molinae
Chilean jasmine	Mandevilla laxa
Chilean mesquite	Prosopis glandulosa
Chilean potato tree	Solanum crispum
Chilean wine palm	Jubaea chilensis
chinaberry	Melia azedarach
chincherinchee	Ornithogalum thyrsoides
Chinese abelia	Abelia chinensis
Chinese dogwood	Cornus kousa chinensis
Chinese evergreen elm	Ulmus parvifolia
Chinese evergreen wisteria	Milletia taiwanensis
Chinese fan palm	Livistona chinensis
Chinese flame tree	Koelreuteria bipinnata
Chinese flame tree	Koelreuteria elegans
Chinese fountain grass	Pennisetum orientale
Chinese foxglove	Rehmannia elata
Chinese fringe tree	Chionanthus retusus
Chinese hackberry	Celtis sinensis
Chinese hibiscus	Hibiscus rosa-sinensis
Chinese holly grape	Mahonia lomariifolia
Chinese indigo	Indigofer decora (incarnata)
Chinese jujube	Ziziphus jujuba
Chinese lilac	Syringa X chinensis

COMMON NAME	BOTANICAL NAME
chinese mahonia	Mahonia fortunei
Chinese maple	Acer truncatum
Chinese photinia	Photinia serratifolia (P. serrulata)
Chinese pieris	Pieris formosa var.forestii
Chinese pistache	Pistacia chinensis
Chinese plumbago	Ceratostigma willmottianum
Chinese redbud	Cercis chinensis
Chinese strawberrry tree	Myrica rubra
Chinese tallow tree	Sapium sebiferum
Chinese toon	Toona sinensis (Cedrela sinensis)
chinquapin oak	Quercus muhlenbergii
chir pine	Pinus roxburghii
chitalpa	X Chitalpa tashkentensis
chocolate cosmos	Cosmos atrosanguineus
chocolate scented daisy	Berlandiera lyrata
Christmas pride	Ruellia macrantha
Christmas/Lenten rose	Helleborus spp.
chuparosa	Justicia californica
cider gum	Eucalyptus gunnii
cigar plant	Cuphea ignea
cinnamon fern	Osmunda cinnamomea
cinquefoil	Potentilla fruticosa cvs.
Clanwilliam daisy	Euryops speciosissimus
Clark lily turf	Ophiopogon clarkii
clay wattle	Acacia glaucoptera
Cleveland/Alan Chickering etc.	Salvia clevelandii & hybrids
cliff date palm	Phoenix rupicola
cliff rose	Cowania mexicana
climbing hydrangea	Hydrangea anomala petiolaris
climbing roses	Rosa hybrids..climbing
climbing snapdragon	Asarina barclaiana (Maurandya)
cluster pine	Pinus pinaster
clustered fishtail palm	Caryota mitis
Coahuila sage	Salvia coahuilensis
Coahuilan hesperaloe	Hesperaloe funifera
coast beefwood	Allocasuarina verticillata (Casuarina stricta)
coast live oak	Quercus agrifolia
coast redwood	Sequoia sempervirens
coast rosemary	Westringia fruiticosa (rosmariniformis)
coast silktassel	Garrya eliptica
coastal bush lupine	Lupinus arboreus
coastal statice	Limonium commune var. californicum
cockspur coral tree	Erythrina crista-galli
coffeeberry	Rhamnus californicus
Colorado spruce	Picea pungens
columbia lewisia	Lewisia columbiana rupicola
columbine	Aquilegia spp.
combretum	Combretum fruticosum
common bluebeard	Caryopteris incana
common guava	Psidium guajava
common hackberry	Celtis occidentalis
common heliotrope	Heliotropum arborescens
common jasmine	Jasminum officinale f. grandiflorum
common witch hazel	Hamamelis virginiana
common yarrow	Achillea millefolium & hybrids
cone flower	Echinacea spp.

COMMON NAME	BOTANICAL NAME
coneflower	Rudbeckia spp.
confederate rose	Hibiscus mutabilis
coolibah	Eucalyptus microtheca
copper false chestnut	Castanopsis cuspidata
coral bells	Heuchera sanguinea
coral gum	Eucalyptus torquata
coral plant	Berberidopsis corallina
coral poker	Kniphofia triangularis (galpinii)
coral tree	Erythryna X bidwillii
coral tree (falcata)	Erythrina falcata
coral vine	Antigonon leptopus
coralberry	Symphoricarpus orbiculatus
coreopsis	Coreopsis lanceolata
cork oak	Quercus suber
corokia	Corokia X virgata
Costa Rica blue sage	Salvia 'Costa Rica Blue'
Costa Rican nightshade	Solanum wendlandii
cotoneaster	Cotoneaster spp. (shrubs)
cotoneaster	Cotoneaster spp.(ground covers)
cottonless cottonwood	Populus 'Red Caudina'
cotyledon	Cotyledon spp.
Coulter pine	Pinus coulteri
cowslip	Lachenalia spp.
coyote brush	Baccharis pilularis consanguinea
coyote mint	Monardella villosa
crabapple	Malus hybrids
cranesbill	Geranium spp.
cranessbill (chrysanthum)	Erodium chrysanthum
crape myrtle	Lagerstroemia indica
crassula	Crassula spp.
creeping baby's breath	Gypsophila repens
creeping buttercup	Ranunculus repens
creeping coprosma	Coprosma X kirkii
creeping fig	Ficus pumila
creeping forget-me-not	Omphalodes verna
creeping globe daisy	Globularia cordifolia
creeping gloxinia	Asarina erubescens (Maurandya)
creeping mahonia	Mahonia repens
creeping red fescue	Festuca rubra
creeping snowberry	Symphoricarpus mollis
creeping wintergreen	Gaultheria procumbens
creeping wire vine	Muehlenbeckia axillaris
creeping/Sonoma sage	Salvia sonomensis
creosote	Larrea tridentata
crepe fern	Todea barbara
crinum lily, spider lily	Crinum spp.
cross vine	Bignonia capreolata
crown of thorns	Euphorbia milii
cruel vine	Araujia sericifera
Cuayamaca cypress	Cupressus arizonica ssp. arizonica
cup and saucer vine	Cobaea scandens
cup flower	Nierembergia hippomanica
cup of gold vine	Solandra maxima
cuphea (micropetala)	Cuphea micropetela
cupid's dart	Catananche caerulea
cushion bush	Calocephalus brownii

COMMON NAME	BOTANICAL NAME
cushion spurge	Euphorbia polychroma (epithymoides)
cut-leaf banksia	Banksia praemorsa
cut leaf Guinea flower	Hibbertia cuniformis
cyclamen	Cyclamen hederifolium
cypress spurge	Euphorbia cyparissias
daffodil	Narcissus spp.
dahlia	Dahlia spp.
daisy tree	Montanoa grandiflora
dalea (bicolor)	Dalea bicolor
dalea (capitata)	Dalea capitata
dalea (dorychnioides)	Dalea dorychnioides
dalea (lutea)	Dalea lutea
dalea (versicolor)	Dalea versicolor
dampiera	Dampiera diversifolia
dampiera	Dampiera trigona
daphne (caucasia)	Daphne caucasica
Darcy sage	Salvia darcyi
date palm	Phoenix dactylifera
David viburnum	Viburnum davidii
dawn redwood	Metasequoia glyptostroboides
day lily	Hemerocallis spp.
deciduous clematis	Clematis hybrids and cvs
deer fern	Blechnum spicant
deer grass	Muhlenbergia rigens
deer weed	Lotus scoparius
delphinium	Delphinium spp.
dendriopoterium	Dendriopoterium menendezii
deodar cedar	Cedrus deodora
desert bird of paradise	Caesalpinea gilliesii
desert broom	Baccharis sarothroides
desert bunch grass	Stipa stipa spinosa
desert cassia	Cassia eremophila (C.nemophila)
desert grape	Vitis girdiana
desert honeysuckle	Anisacanthus spp.
desert ironwood	Olneya tesota
desert lavender	Hyptis emoryi
desert marigold	Baileya multiradiata
desert olive	Forestiera neomexicana
desert spoon	Dasylirion spp.
desert sweet acacia	Acacia smallii
desert willow	Chilopsis linearis
desert/globe mallow	Sphaeralcea spp.
dichondra	Dichondra micrantha
dittany/oregano etc.	Origanum spp.
dobo lily	Cyrtanthus brachyscyphus
dombeya	Dombeya spp.
double mock orange	Philadelphus X virginalis
doublefile viburnum	Viburnum plicatum tomentosum
Douglas iris hybrids	Iris spp.
dragon tree	Dracaena draco
drooping laurel	Leucothoe fontanesiana
drumsticks	Craspedia globosa
dudleya, live forever	Dudleya spp.
dusky coral pea	Kennedia rubicunda
dusty miller	Senecio cineraria
dusty miller (cineraria)	Centaurea cineraria

COMMON NAME	BOTANICAL NAME
Dutchman's pipe	Aristolochia durior
dwarf arrow bamboo	Pseudosasa japonica tsutsumiana
dwarf bamboo	Pleioblastus spp.
dwarf coreopsis	Coreopsis auriculata'Nana'
dwarf coyote brush	Baccharis pilularis cvs.
dwarf fothergilla	Fothergilla gardenii
dwarf jasmine	Jasminum parkeri
dwarf pittosporum	Pittosporum tobira 'Wheelers Dwarf'
dwarf plumbago	Ceratostigma plumbaginoides
dwarf poinciana	Caesalpinea pulcherrima
dwarf pomegranate	Punica granatum 'Nana'
dwarf powderpuff	Calliandra emarginata
dwarf ruellia	Ruellia X brittoniana
dwarf snapdragon	Chaenorhinium glareosum
dwarf umbrella plant	Cyperus albostriatus
dyckia	Dyckia spp.
dymondia	Dymondia margaretae
Easter egg bush	Eremophila racemosa
Easter lily vine	Beaumontia grandiflora
eastern black walnut	Juglans nigra
eastern dogwood	Cornus florida
eastern redbud	Cercis canadensis
eastern white pine	Pinus strobus
Ebbinge's silverberry	Eleagnus X ebbengei
Eddie's white wonder dogwood	Cornus 'Eddie's White Wonder'
edible fig	Ficus carica
edible pear	Pyrus communis
eidelweiss	Leontopodium alpinium
eight-day-healing bush	Lobostemon fruiticosus
eldarica pine	Pinus brutia ssp. eldarica
elderberry	Sambucus spp.
elephant tree	Pachycormis discolor
elephant's ear	Alocasia spp.
elephant's food	Portulacaria afra
empress tree	Paulownia tomentosa
emu bush	Eremophila glabra
English boxwood	Buxus sempervirens
English daisy	Bellis perenis
English holly	Ilex aquifolium
English ivy	Hedera helix
English laurel	Prunus lauroceracus
English oak	Quercus robur
English walnut	Juglans regia
English yew	Taxus baccata
epidendrum	Epidendrum reed stem hybrids
escallonia	Escallonia spp.
escarpment live oak	Quercus fusiformis
eucryphia	Eucryphia x intermedia
eulalia grass	Miscanthus sinensis
eumong/shoestring acacia	Acacia stenophyla
euonymus	Euonymus kiautschovicus
euphorbia	Euphorbia characias
euphorbia	Euphorbia myrsinites
euphorbia	Euphorbia rigida
euphorbia	Euphorbia segueriana niciciana
euphorbia (dulsis)	Euphorbia dulsis

COMMON NAME	BOTANICAL NAME
European beech	Fagus sylvatica
European chain fern	Woodwardia radicans
European cranberry bush	Viburnum opulus
European grape	Vitis vinifera
European hackberry	Celtis australis
European hornbeam	Carpinus betulus 'Fastigiata'
European larch	Larix decidua
European mountain ash	Sorbus aucuparia
European white birch	Betula pendula
euryops/shrub daisy	Euryops pectinatus
evening primrose (pallida)	Oenothera pallida
evening primrose (rosea)	Oenothera rosea
evergreen ash	Fraxinus uhdei
evergreen candy tuft	Iberis sempervirens
evergreen clematis	Clematis armandii
evergreen currant	Ribes viburnifolium
evergreen dogwood	Cornus capitata
evergreen eulalia	Miscanthus transmorrisonensis
evergreen euonymus	Euonymus japonicus
evergreen grape	Rhoicissus capensis
evergreen huckleberry	Vaccinium ovatum
evergreen hydrangea	Dichroa febrifuga
evergreen maple (oblongum)	Acer oblongum
evergreen maple (paxii)	Acer paxii
evergreen mock orange	Philadelphus mexicanus
evergreen pear	Pyrus kawakamii
evergreen pittosporum	Pittosporum crassifolium
evergreen sumac	Rhus choriophylla
evergreen sumac	Rhus virens
evergreen wisteria	Milletia reticulata
evolvulus	Evolvulus pilosus (nuttallianus)
eyelash-leafed sage	Salvia blepharophylla
fairy duster	Calliandra eriophylla
fairy wand	Dierama spp.
false cypress	Chamaecyparis spp.
false heather	Cuphea hyssophyla
false indigo	Baptista australis
false indigobush	Amorpha fruiticosa
false mallow	Anisodontea scabrosa
false mallow	Sidalcea spp.
false spirea	Astilbe hybrids
fan flower	Scaevola 'Mauve Clusters'
farfugium/ligularia	Farfugium japonicum (Ligularia)
fascicularia	Fascicularia pitcairnifolia
feather bush	Lysiloma microphylla var. thornberi
feather grass	Stipa pulchra
feather reed	Calamagrostis spp.
feathery cassia/senna	Senna artemesioides (Cassia artemesioides)
felt fern	Pyrrosia spp.
fern leaf yarrow	Achillea filipendulina
fescue (cinerea)	Festuca cinerea
fescue (tenuifolia)	Festuca tenuifolia
feverfew	Tanacetum parthenium (Chrysanthemum parthenium)
filbert	Corylus maxima
fir	Abies spp.
fire lily	Cyrtanthus purpureus

COMMON NAME	BOTANICAL NAME
Firescape sage	Salvia 'Firescape'
firespike	Odontonema strictum
firethorn	Pyracantha spp.
firewheel tree	Stenocarpus sinuatus
fishtail wine palm	Caryota urens
fiveleaf akebia	Akebia quinata
flame flower	Talinium calcynium
flame pea	Chorizema cordata
flame tree	Brachychiton acerifolius
flame vine	Pyrostegia venusta
flannel bush	Fremontodendron spp.
flax	Phormium hybrids
flax	Linum spp.
flax leaf paper bark	Melaleuca linariifolia
fleabane	Erigeron formosissimus
fleabane	Erigeron karvinskianus
flooded gum	Eucalyptus rudis
flooded/rose gum	Eucalyptus grandis
Florida arrowroot	Zamia pumila
Florida fig	Ficus florida
florists' cyclamen	Cyclamen persicum hybrids
floss silk tree	Chorisia speciosa
flower-of-an-hour	Hibiscus trionum
flowering cherry	Prunus spp. (ornamental)
flowering maple	Abutilon X hybridum
flowering peach	
flowering plum	
flowering quince	Chaenomeles cvs.
flowering woodbine	Lonicera periclymenum
foothill needlegrass	Nassella lepida
foothill stipa	Stipa lepida
foothill/Gray pine	Pinus sabiniana
forest bell bush	Mackaya bella
forest Boer bloom	Schotia latifolia
forest lily	Velthemia bracteata
forest oak	Allocasuarina torulosa
forget-me-not	Myosotis scorpioides
Forman's mallee	Eucalyptus formanii
forsythia	Forsythia X intermedia
forsythia sage	Salvia madrensis
fortnight lily	Dietes bicolor
fortnight lily	Dietes iridioides
fountain butterfly bush	Buddleja alternifolia
fountain grass	Pennisetum setaceum
four o'clock	Mirabilis jalapa
foxberry	Vaccinium vitis-idaea
foxglove	Digitalis X mertonensis
fragrant Himalayan champaca	Michelia champaca
fragrant sarcococca	Sarcococca ruscifolia
fragrant sumac	Rhus aromatica
frangipani	Plumeria rubra
franklin tree	Franklinia alatamaha (Gordonia)
Fraser photinia	Photinia X fraseri
Freeman maple	Acer X freemanii
Fremont silktassel	Garrya fremontii
Fremont's bush mallow	Malacothamnus fremontii

COMMON NAME	BOTANICAL NAME
fringe cups	Tellima grandiflora
fringe flower	Loropetalum chinense
fuchsia	Fuchsia spp.
fuchsia begonia	Begonia fuchoides rosea
fuchsia flowering gooseberry	Ribes speciosum
furcraea	Furcraea spp.
Galpin's leucadendron	Leucadendron galpinii
gamolepis	Gamolepis chrysanthemumoides
garden geranium	Pelargonium X hortorum
garden monkshood	Aconitum napellus
garden verbena	Verbena hybrids
garden/kitchen sage	Salvia officinalis
gardenia	Gardenia spp.
garland lily	Calostemma purpureum
gaura	Gaura lindheimeri
gay feather	Liatris spicata
gazania	Gazania spp.
gentian	Gentiana scabra procumbens
gentian sage	Salvia patens
Geraldton wax flower	Chamelaucium uncinatum
geranium (sidoides)	Pelargonium sidoides
germander	Teucrium chamaedrys
germander (crispum)	Teucrium scorodonia 'Crispum'
germander (hyrcanicum)	Teucrium hyrcanicum
giant bird of paradise	Strelitzia nicolai
giant Burmese honeysuckle	Lonicera hildebrandiana
giant chain fern	Woodwardia fimbriata
giant coreopsis	Coreopsis gigantea
giant four o'clock	Mirabilis multiflora
giant hyssop	Agastache aurantica
giant lily turf	Ophiopogon jaburan
giant needle grass	Stipa gigantea
giant reed	Arundo donax
giant sequoia	Sequoiadendron giganteum
giant thevetia	Thevetia thevetioides
Gibraltar candytuft	Iberis gibraltarica
gladiolus	Gladiolus spp.
gladiolus	Gladiolus hybrids & selections
globe daisy	Globularia X indubia
globe thistle	Echinops exaltus
globeflower	Trollius spp.
glory bower	Clerodendrum phillippinum
glory bush	Tibuchina heteromalla
glossy abelia	Abelia X grandiflora
glossy privet	Ligustrum lucidum
gold coin	Odontospermum hybrida
gold coin, Canary Island daisy	Asteriscus maritimus
gold flower	Hypericum X moseranum
gold medallion tree	Cassia leptophylla
golden-eyed grass	Sisyrinchium californicum
golden abundance mahonia	Mahonia 'Golden Abundance'
golden chain tree	Laburnum X watereri
golden currant	Ribes aureum
golden fleece	Dyssodia pentachaeta
golden foxtail	Alopecurus pratensis 'Aureus'
golden larch	Pseudolarix kaempheri

COMMON NAME	BOTANICAL NAME
golden privet	Ligustrum X vicaryi
golden rain tree	Koelreuteria paniculata
golden scabweed	Raoulia australis
golden sundrops	Oenothera fruiticosa
golden sunflower	Heliopsis helianthoides scabra
golden trumpet tree	Tabebuia chrysotricha
golden trumpet vine	Allamanda cathartica
golden wonder	Senna splendida (Cassia splendida)
golden wood millet	Milium effusum
golden yarrow	Eriophyllum confertiflorum
goldenbush	Isocoma spp. (Haplopappus)
goldeneye	Viguiera deltoidea
Goldman's senna/cassia	Senna polyantha (Cassia goldmanii)
Goodding verbena	Verbena gooddingii
gordonia	Gordonia axillaris
Gowen cypress	Cupressus goveniana
granite honey-myrtle	Melaleuca elliptica
grape hyacinth	Muscari macrocarpum
grape ivy	Cissus rhombifolia
grape soda lupine	Lupinus excubitus
grapefruit-scented sage	Salvia dorisiana
graptopetalum	Graptopetalum spp.
grass tree	Xanthorrhoea spp.
grassy bells	Edraianthus graminifolius
graythorn	Ziziphus obtusifolia
great blue lobelia	Lobelia siphilitica
greater masterwort	Astrantia major rosea
greater woodrush	Luzula sylvatica
Grecian horehound	Ballota pseudodictamnus
Greek yarrow	Achillea ageratifolia
green ash	Fraxinus pennsylvanica'Marshal'
green carpet	Herniaria glabra
green euryops	Euryops pectinatus viridis
green gem ficus	Ficus microcarpa 'Green Gem'
green kangaroo paw	Anigozanthos viridis
green wattle	Acacia decurrens
grevillea	Grevillea spp.
grey honey-myrtle	Melaleuca incana
Griffith ash	Fraxinus griffithi
ground ivy	Glechoma hederaceae
ground morning glory	Convolvulus sabatius
groundsel	Brachyglottis greyi (Senecio greyi)
Guadalupe island rock daisy	Perityle incana
Guadalupe palm	Brahea edulis
guajillo	Acacia berlandieri
Guatemalan blue sage	Salvia cacaliaefolia
Guatemalan holly	Olmediella betschleriana
Guinea gold vine	Hibbertia scandens
gum myrtle	Angophora cordifolia (Angophora costata)
gum plant	Grindelia camporum
gunnera	Gunnera magellanica
habranthus	Habranthus tubispathus
hairy awn muhly	Muhlenbergia capillaris
hairy canary clover	Dorycnium hirsutum
hairy golden aster	Heterotheca villosa (chrysopsis villosa)
hairy lip fern	Cheilanthes lanosa

COMMON NAME	BOTANICAL NAME
hairy wattle	Acacia vestita
hakone grass	Hakonechloa macra
Hall's honeysuckle	Lonicera japonica 'Halliana'
halmiocistus	X Halimiocistus sahucci
halmiocistus	X Halmiocistus wintonensis
hammock fern	Blechnum occidentale
Hardijizer's beauty	Azaliadendron 'Hardjizer's Beauty'
hardy alyssum/basket of gold	Aurinia saxatilis
hardy begonia	Begonia grandis
hardy eucryphia	Eucryphia glutinosa
hardy/straw foxglove	Digitalis lutea
harlequin glory bower	Clerodendrum trichotomun
Harry Lauder's walking stick	Corylus avelleana contorta
Hart's tongue fern	Asplenium scolopendrium (Phyllitis)
Hawaiian elf schefflera	Schefflera arboricola
Hawaiian snow bush	Breynia nivosa (distacha)
Hawaiian tree fern	Cibotium glaucum
haworthia	Haworthia spp.
hawthorn	Crataegus spp.
heart-leaved penstemmon	Keckiella cordifolia
heartleaf bergenia	Bergenia cordifolia
heartleaf geranium	Pelargonium cordifolium
heath	Erica spp.
heath-leafed banksia	Banksia ericifolia
heath melaleuca	Melaleuca ericifolia
heavenly bamboo	Nandina domestica
heavenly bamboo (Nana)	Nandina domestica 'Purpurea'
heavenly blue	Lithodora diffusa
hebe	Hebe spp.
hedge maple	Acer campestre
helianthemum	Helianthemum nummularium
Henry St. John's wort	Hypericum beanii
hens and chickens	Echeveria spp.
heron's-bill	Erodium corsicum
hesperantha	Hesperantha spp.
hibbertia (aspera)	Hibbertia aspera
hibbertia (pedunculata)	Hibbertia pedunculata
hibbertia (vestita)	Hibbertia vestita
Himalayan blueberry	Vaccinium moupinense
Himalayan ivy	Hedera nepalensis
hippolytia	Hippolytia herderi (Tanacetum herderi)
hoary pea	Tephrosia grandiflora
hoary vervian	Verbena stricta
holly fern	Cyrtomium falcatum
holly leaf cherry	Prunus ilicifolia
holly oak	Quercus ilex
holly sweetspire	Itea ilicifolia
hollyleaf redberry	Rhamnus croceus ilicifolia
honey bush	Melianthus major
honey locust	Gleditsia triacanthos
Honey mesquite	Prosopis glandulosa glandulosa
honeysuckle (confusa)	Lonicera confusa
honeysuckle (hispidula)	Lonicera hispidula
Hong Kong orchid tree	Bauhinia X blakeana
hopseed bush	Dodonaea viscosa
hopseed bush (procumbens)	Dodonaea procumbens

COMMON NAME	BOTANICAL NAME
horned violet	Viola cornuta
horsetail	Equisetum spp.
houpara	Pseudopanax lessonii
house leek	Sempervivum spp.
hummingbird/pitcher sage	Salvia spathacea
hyacinth bean	Labab purpureus (Dolichos labab)
hyacinth orchid	Bletilla striata
hybrid brachychiton	Brachychiton X hybridus
hybrid leucadendron	Leucadendron hybrids
hybrid magnolias	Magnolia hybrids
hydrangea	Hydrangea macrophylla
hypericum (e. nanum)	Hypericum empetrifolium nanum
hypericum (frondosum)	Hypericum frondosum
ice plant (Aptenia)	Aptenia cordifolia
ice plant (Carpobrotus)	Carpobrotus spp.
ice plant (Cephalophyllum)	Cephalophyllum spp.
ice plant (Delosperma)	Delosperma spp.
ice plant (Drosanthemum)	Drosanthemum spp.
ice plant (Lampranthus)	Lampranthus spp.
ice plant (Maleophora)	Maleophora spp.
ice plant (Red Apple)	Aptenia 'Red Apple'
Idaho fescue	Festuca idahoensis
impatiens (uguensis)	Impatiens uguensis
incense cedar	Calocedrus decurrens
Indian hawthorne	Rhaphiolepis indica
Indian laurel fig/ laurel fig	Ficus microcarpa
indian mallow	Abutilon palmeri
Indian mock strawberry	Duchesnea indica
indigo/pea bush	Dalea pulchra
inside-out flower	Vancouveria spp.
interior live oak	Quercus wislizeni
inula	Inula ensifolia
inyouchikuzoku	Hibanobambusa tranquillans
Irish heath	Daboecia cantabrica
Irish moss	Sagina subulata
Irish yew	Taxus baccata 'Fastigiata'
Irish, Scotch moss	Arenaria spp. (See Sagina)
island alum root	Heuchera maxima
island bush snapdragon	Galvesia speciosa
island oak	Quercus tomentella
isoplexis	Isoplexis chalcantha
Italian alder	Alnus cordata
Italian Arum	Arum italicum
Italian buckthorn	Rhamnus alaternus
Italian cypress	Cupressus sempervirens
Italian jasmine	Jasminum humile
Italian stone pine	Pinus pinea
Ithuriel's spear	Tritelia laxa
ivy geranium	Pelargonium peltatum
jacaranda	Jacaranda mimosifolia
Jack Fogg michelia	Michelia X foggi 'Jack Fogg'
Jacob's ladder	Polemonium spp.
Jacob's rod/kings spear	Asphodeline lutea
Japanese anemone	Anemone X hybrida
Japanese aralia	Fatsia japonica
Japanese ardesia, marlberry	Ardisia japonica

COMMON NAME	BOTANICAL NAME
Japanese aucuba	Aucuba japonica
Japanese black pine	Pinus thumbergii
Japanese blood grass	Imperata cylindrica 'Rubra'
Japanese blueberry tree	Elaeocarpus decipiens
Japanese boxwood	Buxus microphylla japonica
Japanese cryptomeria	Cryptomeria japonica
Japanese dogwood	Cornus kousa
Japanese false oak	Lithocarpus edulis (Pasania edulis)
Japanese honeysuckle	Lonicera japonica
Japanese iris	Iris spp.
Japanese knotweed	Fallopia japonica
Japanese lace fern	Polystichum polyblepharum
Japanese maple	Acer palmatum
Japanese mountain birch	Betula platyphyla japonica
Japanese pagoda tree	Sophora japonica
Japanese persimmon	Diospyros kaki
Japanese privet	Ligustrum japonicum
Japanese red pine	Pinus densiflora
Japanese rose	Kerria japonica
Japanese rose	Rosa rugosa
Japanese skimmia	Skimmia japonica
Japanese snowbell	Styrax japonicum
Japanese spurge	Pachysandra terminalis
Japanese stewartia	Stewartia pseudocamellia
Japanese ternstroemia	Ternstroemia gymnanthera
Japanese umbrella pine	Sciadopitys verticillata
Japanese viburnum	Viburnum japonicum
Japanese white pine	Pinus parviflora
Japanese yew	Taxus cuspidata
jasmine (beesianum)	Jasminum beesianum
jasmine (leratii)	Jasminum leratii
jasmine (tortulosum	Jasminum tortuosum
Javan grape	Tetrastigma voinieranum
Jeffrey pine	Pinus jeffreyi
Jelecote pine	Pinus patula
Jerusalem sage	Phlomis fruticosa
jojoba	Simmondsia chinensis
jubilee wallflower	Erysimum 'Jubilee'
Judas tree	Cercis siliquastrum
jungle geranium	Ixora coccinia
juniper	Juniperus spp.
justicia (leonardii)	Justicia leonardii
Kaffir bloom coral tree	Erythrina caffra
Kaffir lily	Clivia miniata
Kaffir lily	Schizostylis coccinia
Kaffir plum	Harpephyllum caffrum
Kahili ginger	Hedychium garnerianum
kalanchoe	Kalanchoe spp.
kangaroo apple	Solanum aviculaare
kangaroo paw	Anigozanthos flavidus
kangaroo treebine	Cissus antarctica
kapuka	Griselinia littoralis
Karwinski's sage	Salvia karwinskii
Katsura tree	Cercidiphyllum japonicum
Keller hypericum	Hypericum kelleri
kellerii achillea	Achillea X kellerii

COMMON NAME	BOTANICAL NAME
Kenilworth ivy	Cymbalaria muralis
Kentia palm	Howea forsterana
Kew broom	Cytisus X kewensis
king palm	Archontophoenix cunninghamiana
kiwi	Actinidia deliciosa
kiwi/Tara	Actinidia arguta
kleinia	Senecio mandraliscae
knife acacia	Acacia cultriformis
knobcone-Monterey pine	Pinus X attenuradiata
knobcone pine	Pinus attenuata
Korean lilac	Syringa patula
Korean spice viburnum	Viburnum carlesii
kunzea	Kunzea spp.
Labrador violet	Viola labradorica
lace fern	Microlepia strigosa
lacecap hydrangea	Hydrangea aspera villosa
Lady Banks rose	Rosa banksiae
lady fern	Athyrium filix-femina
lady palm	Rhapis excelsa
ladybells	Adenophora bulleyana
lambertia	Lambertia intermis
lamb's ears	Stachys byzantina
lantana	Lantana camara
lantern tree	Crinodendron hookerianum
laurel leaf cocculus	Cocculus laurifolius
laurel sumac	Malosma laurina (Rhus laurina)
laurustinus	Viburnum tinus
lavatera	Lavatera hybrids
lavender	Lavandula spp.
lavender beautyberry	Callicarpa dichotoma
lavender cotton	Santolina spp.
lavender mist	Thalictrum rochenbrunianum
lavender shower	Thalictrum delavayi
lavender star flower	Grewia occidentalis
leather leaf fern	Rumohra adiantiformis
leatherleaf acacia	Acacia craspedocarpa
leatherleaf mahonia	Mahonia bealei
leatherleaf viburnum	Viburnum rhytidophyllum
leatherwood	Eucryphia lucida (billardieri)
Lehua of Hawaii	Metrosideros collinia
lemon balm	Melissa officinalis
lemon flowered gum	Eucalyptus woodwardii
lemon scented gum	Eucalyptus citriodora
lemon scented jasmine	Jasminum azoricum
lemon scented tea tree	Leptospermum petersonii
lemon verbena	Aloysia triphylla
lemonade berry	Rhus integrifolia
leopard's bane	Doronicum orientale (D. caucasium)
lewisia	Lewisia hybrids
Leyland cypress	X Cupressocyparis leylandii
libertia	Libertia spp.
licorice plant	Helichrysum petiolare
lilac	Syringa vulgaris
lilac verbena	Verbena lilacina
lilac vine	Hardenbergia violacea
lily	Lilium (garden hybrids)

COMMON NAME	BOTANICAL NAME
lily-of-the-Nile	Agapanthus africanus
lily-of-the-valley shrub	Pieris japonica (taiwanensis)
lily-of-the-valley tree	Crinodendron patagua
lilyleaf ladybells	Adenophora liliifolia
lilyturf	Liriope spp.
limber pine	Pinus flexilis
Lindheimer muhly	Muhlenbergia lindheimeri
Lindheim's senna/cassia	Senna lindheimeriana (Cassia lindheimeriana)
lion's tail	Leonotis leonurus
little cabbage tree	Cussonia paniculata
little leaf cordia	Cordia parvifolia
little leaf linden	Tilia cordata
little leaf myrtle	Tristaniopsis laurina
little leaf palo verde	Cercidium microphyllum
little Tyler/blue stars	Aristea ecklonii
littleaf sumac	Rhus microphylla
livistona (rigida)	Livistona rigida
lob lolly bay	Gordonia lasianthus
lobelia (chinensis)	Lobelia chinensis
lobelia (ricardii)	Lobelia ricardii
locust	Robinia X ambigua
loebner magnolia	Magnolia X loebneri
Lombardy poplar	Populus nigra 'Italica'
London plane	Platanus X acerifolia and cvs.
long flowered marlock	Eucalyptus macranda
long leaf yellow wood	Podocarpus henkelii
longleaf mahonia	Mahonia nervosa
loosestrife/moneywort	Lysimachia spp.
loquat	Eryobotrya japonica
low bull rush	Isolepis cernua (Scirpus cernuus)
luculia	Luculia pinceana
Ludgvan cross agapetes	Agapetes 'Ludgvan Cross'
lungwort	Pulmonaria spp.
Lydia woadwaxen	Genista lydia
macadamia nut	Macadamia spp.
Madagascar jasmine	Stephanotis floribunda
Madagascar palm	Pachypodium lamerei
Madagascar periwinkle	Catharanthus roseus
madrone	Arbutus menziesii
magic flower	Cantua buxifolia
maiden hair tree	Ginkgo biloba
maidenhair fern	Adiantum spp.
majestic beauty	Rhaphiolepis 'Majestic Beauty'
Majorcan germander	Teucrium cossonii
male fern	Dryopteris felix-mas
mallow rose	Hibiscus moscheutos
Maltese cross	Lychnis chalcedonica
mandevilla	Mandevilla splendens
manfreda	Manfreda spp.
mangle dulce	Maytenus phyllanthoides
maniko	Salvia koyamae
manna gum	Eucalyptus viminalis
manzanita	Arctostaphylos spp.
manzanita cultivars	Arctostaphylos cultivars
maraschino sage	Salvia 'Maraschino'
marbled bamboo	Chimonobambusa marmorea (Arundinarea)

COMMON NAME	BOTANICAL NAME
Marguerite daisy	Argyranthemum frutescens
Marina arbutus	Arbutus 'Marina'
markhamia	Markhamia lutea (hildebrandtii)
marmalade bush	Streptosolen jamesonii
Martha Washington pelargonium	Pelargonium domesticum
Mascarene grass	Zoyzia tenuifolia
mastic tree	Pistacia lentiscus
Matilija poppy	Romneya coulteri
mattress vine	Muehlenbeckia complexa
Maximilian sunflower	Helianthus maximiliani
May lily	Maianthemum dilatatum
mayten tree	Maytenus boaria
mazus	Mazus reptans
meadow rue	Thalictrum fendleri var. polycarpum
meadow rue (coreanum)	Thalictrum coreanum
meadow rue (flavum)	Thalictrum flavum spp glaucum
Meadowsweet	Filipendula vulgaris
Mediterranean fan palm	Chamaerops humilis
medow rue	Thalictrum polycarpum
medow sage	Salvia pratensis haematodes
melaleuca (fulgens)	Melaleuca fulgens
merremia (aurea)	Merremia aurea
merremia (quinquefolia)	Merremia quinquefolia
mesa oak	Quercus engelmannii
Mexican abelia	Abelia floribunda
Mexican bird of paradise	Caesalpinea mexicana
Mexican buckeye	Ungnadia speciosa
Mexican bush lobelia	Lobelia laxiflora
Mexican bush sage	Salvia leucantha
Mexican cardinal flower	Lobelia fulgens
Mexican cardinal sage	Salvia fulgens
Mexican cycad	Dioon spp.
Mexican fan palm	Washingtonia robusta
Mexican feather grass	Stipa tenuissima
Mexican flame vine	Pseudogynoxys chenopodiodes (Senecio)
Mexican hat	Ratibida columnifera
Mexican honeysuckle	Justicia spicigera
Mexican lily	Beschorneria yuccoides
Mexican orange	Choisya ternata
Mexican oregano	Poliomintha longiflora
Mexican palo verde/ Jerusalem thorn	Parkinsonia aculeata
Mexican pitcher sage	Lepechinia hastata
Mexican redbud	Cercis mexicana
Mexican sage	Salvia mexicana
Mexican tarragon	Tagetes lucida
Mexican tulip poppy	Hunnemannia fumarifolia
Mexican weeping bamboo	Otatea acuminata (aztecorum)
Mexican/white evening primrose	Oenothera speciosa
Meyer's Yew	Taxus 'Meyeri'
milk bush	Euphorbia tirucalli
milk/silk weed	Asclepias (wild species)
mindinao gum	Eucalyptus deglupta
mint	Mentha spp.
mint bush	Prostanthera denticulata
mirror plant	Coprosma repens
mission manzanita	Xylococcus bicolor

COMMON NAME	BOTANICAL NAME
mistflower	Eupatorium spp.
mock orange	Pittosporum tobira
Modesto ash	Fraxinus velutina 'Modesto'
Mohave poplar	Populus 'Mohavensis'
Mohawk viburnum	Viburnum 'Mohawk'
mondo grass	Ophiopogon japonicus
monkey flower	Mimulus spp. (shrubby)
monkey flower	Mimulus spp. (herbaceous)
monkey puzzle tree	Araucaria araucana
monochaetum	Monochaetum volcanicum
montbrieta	Crocrosmia hybrids (Tritonia)
Monterey cypress	Cupressus macrocarpa
Monterey pine	Pinus radiata
Montezuma cypress	Taxodium mucronatum
Montezuma pine	Pinus montezumae
Moor grass	Molinia caerulea
Moor grass	Sesleria spp.
moraea	Moraea spp. (summer growing)
moraine ash	Fraxinus 'Moraine'
morea	Moraea spp.(winter growing)
Moreton Bay chestnut	Castanospermum australe
Moreton Bay fig	Ficus macrophylla
Moroccan daisy	Pyrethropsis hosmariense
mosquito plant	Agastache cana
moss pink	Phlox subulata
moss pink/campion	Silene spp.
moss verbena	Verbena tenuisecta
mother-in-law's tongue etc.	Gasteria spp.
mother fern	Asplenium bulbiferum
Mount Atlas daisy	Anaclycus pyrethrum var depressus
mountain alyssum	Alyssum montanum
mountain ash	Sorbus hupehensis
mountain ironwood	Cercocarpus betuloides
mountain marigold	Tagetes lemmoni
mountain pennyroyal	Monardella odoratissima
mountain sage	Salvia regla
mountain wood rose	Rosa woodsii var. ultramontana
Mrs. Beard sage	Salvia 'Mrs. Beard'
Mueller's fescue	Festuca muelleri
mugo pine	Pinus mugo
mulga	Acacia aneura
mullein	Verbascum bombiciferum
myoporum	Myoporum laetum
myoporum	Myoporum parvifolium & cvs.
Nageia	Nageia nagi (Podocarpus nagi)
naked coral tree	Erythrina americana(E.coralloides)
naked lady	Amaryllis belladona
Narihira bamboo	Semiarundinaria fastuosa
narrow leaf rosewood	Vauquelinia corymbosa var. heterodon
nasturtium	Tropaeolum majus
Natal coral tree	Erythrina humeana
Natal plum	Carissa macrocarpa (prost.cvs.)
Natal plum	Carissa spp.
native fleabane	Erigeron divergens
navelwort	Omphalodes cappadocica
nealy cup sage	Salvia farinacea

COMMON NAME	BOTANICAL NAME
nectarine	
needleleaf acacia	Acacia rigens
neem	Azadirachta indica
Nepal holly	Ilex integra
nerine	Nerine spp.
net bush	Calothamnus quadrifidus
Nevin mahonia	Mahonia nevinii
New Zealand cabbage tree	Cordyline australis
New Zealand cassia/senna	Senna bicapsularis (Cassia candolleana)
New Zealand Christmas tree	Metrosideros excelsa
New Zealand flax	Phormium tenax
New Zealand laurel	Corynocarpus laevigata
New Zealand tea tree	Leptospermum scoparium
Newell cestrum	Cestrum fasciculatum var. 'Newellii
Nichol's willow leaf peppermint	Eucalyptus nicholii
night jessamine	Cestrum nocturnum
Nikau palm	Rhopalostylis sapida
nodding feather grass	Stipa cernua
nodding needlegrass	Nassella cernua
nodding pincushion	Leucospermum cordifolium
Norfolk Island pine	Araucaria heterophyla
Norfolk palm	Rhopalostylis baueri
Norway maple	Acer platanoides
Norway spruce	Picea abies
Nutall's scrub oak	Quercus dumosa
oakleaf hydrangea	Hydrangea quercifolia
obedient plant	Physostegia virginiana
O'Conners legume(revegetation use)	Trifolium fragiferum O'Connor
O'Connors legume(landscape use)	Trifolium fragiferum O'Connor
ocotillo	Fouquieria splendens
Okame-Zaza bamboo	Shibatea kumasasa
Okinawan holly	Ilex dimorphophilla
old man cactus	Cephalocereus spp.
oleander	Nerium oleander
olive	Olea europaea
olympic hypericum	Hypericum olympicum
orange cestrum	Cestrum auranticum
orange clock vine	Thunbergia gregorii
orange jessamine	Murraya paniculata
orange jubilee tecoma	Tecoma 'Orange Jubilee'
orange sneezeweed	Helenium hoopesii
orange, lemon etc.	Citrus spp.
Oregon alder	Alnus oregona
Oregon ash	Fraxinus latifolia
Oregon fleabane	Erigeron speciosus
Oregon grape	Mahonia aquifolium
organ pipe cactus	Stenocereus thurberi (Lemaireocereus)
oriental arborvitae	Platycladus orientalis
oriental poppy	Papaver orientale
oriental spruce	Picea orientalis
ornamental asparagus	Asparagus spp.
orono	Azara dentata
orthrosantus	Orthrosanthus chimboracensis centroamericanus
orthrosantus	Orthrosanthus multiflorus
ostrich fern	Matteuccia struthiopteris
oyama magnolia	Magnolia sieboldii

COMMON NAME	BOTANICAL NAME
Ozark sundrops	Oenothera macrocarpa
ozothamnus	Ozothamnus rosemarinifolius(Helichrysum)
Pacific wax myrtle	Myrica californica
pacifica saltbush	Myoporum X 'Pacificum'
painted daisy	Tanacetum coccinium (Pyrethrum roseum)
painted lady fern	Athyrium nipponicum 'Pictum'
palm grass	Setaria palmifolia
palm lily	Cordyline stricta
palmetto	Sabal spp.
palo blanca	Lysiloma candida
palo blanco	Acacia willardiana
palo Colorado	Luma apiculata
pampas grass	Cortaderia sellowana cvs.
pampas lily	Habranthus robustus (Zephranthes)
paper flower	Psilostrophe cooperi
paper flower	Psilostrophe tagetina
paperbark maple	Acer griseum
Paraguay nightshade/blue potato bush M	Lycianthus rantonnetii
parrot's beak	Clianthus puniceus
Pasque flower	Pulsatilla vulgaris (Anemone pulsatilla)
passion vine	Passiflora spp.
pattersonia	Pattersonia drummondii
peach	
peach (low chill only)	
pearl acacia	Acacia podalyriifolia
pearl bluebush	Maireana sedifolia
pecan	Carya illinoensis
peegee hydrangea	Hydrangea paniculata 'Grandiflora'
pennatula acacia	Acacia pennatula
penstemon (hybrids)	Penstemon hybrids
penstemon (wild)	Penstemon wild spp.
peony	Paeonia spp.
pepper tree	Drimys lanceolata
peppermint-scented geranium	Pelargonium tomentosum
peppermint tree	Agonis flexuosa
perennial cornflower	Centaurea montana
perennial lobelia	Lobelia richmondensis
periwinkle	Vinca major
periwinkle	Vinca minor
Persian knapweed	Centaurea dealbata
Persian lilac	Syringa X persica
Persian witch hazel	Parrotia persica
Peruvian apple cactus	Cereus peruvianus
Peruvian lily	Alstroemeria spp.
Peruvian lily	Scilla peruviana
Peruvian old man cactus	Espostoa lantana
Peruvian pepper	Schinus polygamous
Peruvian verbena	Verbena peruviana
phanera	Bauhinia corymbosa
phlomis (caballeroi)	Phlomis caballeroi
phlomis (cashmeriana)	Phlomis cashmeriana
phlomis (cretica)	Phlomis cretica
phlomis (italica)	Phlomis italica
phlomis (lanata)	Phlomis lanata
phlomis (purpurea)	Phlomis purpurea
phlomis (russeliana)	Phlomis russeliana

COMMON NAME	BOTANICAL NAME
phlomis (tuberosa)	Phlomis tuberosa
phlox	Phlox (shrubby cvs.)
pichi	Fabiana imbricana
pigmy date palm	Phoenix roebelenii
pimpernel	Anagallis monellii
pin oak	Quercus palustris
pincushion flower	Scabiosa spp.
pindo palm	Butia capitata
pine-leafed bottlebrush	Callistemon pinifolius
pineapple guava	Acca sellowiana (Feijoa sellowiana)
pineapple lily	Eucomis bicolor hybrids
pineapple sage	Salvia elegans
pinellia	Pinellia ternata
pink jasmine	Jasminum polyanthum
pink powder puff	Calliandra haematocephala
pink tips/white bottlebrush	Callistemon salignus
pink/carnation	Dianthus spp.
pink/lavender trumpet tree	Tabebuia impetiginosa (ipe)
pink/yellow calla lily	Zantedeschia spp. & hybrids
pink-flowering sumac	Rhus lentii
pink evening primrose	Oenothera speciosa 'Rosea'
pink melaleuca	Melaleuca nesophila
pink trumpet vine	Podranea ricasoliana
pinyon pine	Pinus edulis
pipestem clematis	Clematis lasiantha
pistachio	Pistacia vera
pithecoctenium	Pithecoctenium crucigerum
plantain lily	Hosta spp.
plum	
plum (low chill only)	
plume albizia	Albizia distachya
plume grass	Erianthus ravennae
plume poppy	Macleaya spp.
plypody	Polypodium (native spp.)
poinsettia	Euphorbia pulcherrima
polypody	Polypodium (subtropical spp.)
pomegranate	Punica granatum
ponderosa pine	Pinus ponderosa
poor knight's lily	Xeronema calistemon
poor man's orchid	Neomarica caerulea
poor man's rhododendron	Impatiens sodeni (oliveri)
poppy	Papaver pilosum
porcupine flower	Centratherum punctatum
Portugal laurel	Prunus lusitanica
potato vine	Solanum jasminoides
poverty weed	Iva hayesiana
Prague viburnum	Viburnum X pragense
prairie flameleaf sumac	Rhus lanceolata
prairie sage	Salvia azurea grandiflora
prairie zinnia	Zinnia grandiflora
pratia	Pratia angulata
prickly-leaved paperback	Melaleuca styphelioides
prickly heath	Gaultheria mucronata (Pernettya mucronata)
prickly pear/cholla	Opuntia spp.
pride of Madeira	Echium candicans (fastuosum)
pride of Teneriffe	Echium pininana

COMMON NAME	BOTANICAL NAME
primrose jasmine	Jasminum mesnyi
primrose tree	Lagunaria patersonii
princess flower	Tibuchina urvilleana (semidecandra)
prostrate acacia	Acacia redolens
protea	Protea spp.
prune	
Pt. Reyes wallflower	Erysimum suffrutescens (concinnum)
puka	Griselinia lucida
puka	Meryta sinclairii
purple heart setcreasea	Setcreasea pallida 'Purple Heart'
purple hopseed bush	Dodonaea viscosa 'Purpurea'
purple magesty sage	Salvia 'Purple Majesty'
purple meadow rue	Thalictrum aquilegifolium
purple mullein	Verbascum phoeniceum
purple needlegrass	Nassella pulchra
purple nightshade	Solanum xantii
purple orchid tree	Bauhinia variegata (purpurea)
purple orchid vine	Mascagnia lilacina
purple prairie clover	Dalea gattingeri (Petalostemum purpureum)
purple rain sage	Salvia verticillata 'Purple Rain'
purple sage	Salvia dorrii
purple sage	Salvia leucophylla
purple sage, Texas ranger etc.	Leucophyllum spp.
purple tower echium	Echium 'Purple Tower'
purple wings	Dalechampia dioscorifolia
purple winter creeper	Euonymus fortunei
purple woodrush	Luzula purpurea
purple/burgundy fountain grass	Pennisetum setaceum cvs,
pussy toes	Antennaria rosea
puya	Puya spp.
quaking grass	Briza media
queen palm	Syagrus romanzoffiana
queen's tears etc.	Billbergia spp.
queens wreath	Petrea volubilis
Queensland bottle tree	Brachychiton rupestris
Queensland kauri	Agathis robusta
Queensland lace bark	Brachychiton discolor
Queensland pittosporum	Pittosporum rhombifolium
Queensland umbrella tree	Schlefflera actinophylla (Brassaia)
rabbit brush	Chrysothamnus nauseosus albicaulis
rabbit's foot fern	Phlebodium aureum (Polypodium aureum)
Raleigh westringia	Westringia raleighi
rama parda	Ruellia californica
ravanea	Ravanea rivularis
raywood ash	Fraxinus oxycarpa 'Raywood'
red-barked dogwood	Cornus alba
red-veined enkianthus	Enkianthus campanulatus
red buckeye	Aesculus pavia
red cap gum	Eucalyptus erythrocorys
red centered hibiscus	Alyogyne hakeifolia
red cestrum	Cestrum elegans
red flowering currant	Ribes sanguineum
red flowering gum	Eucalyptus ficifolia
red ginger	Hedychium greenei
red ginger lily	Hedychium coccinium
red gum	Eucalyptus camaldulensis

COMMON NAME	BOTANICAL NAME
red horsechestnut	Aesculus X carnea
red hot poker	Kniphofia uvaria
red huckleberry	Vaccinium parvifolium
red iron bark	Eucalyptus sideroxylon
red justicia	Justicia candicans
red oak	Quercus rubra
red orchid bush	Bauhinia galpinii
red osier dogwood	Cornus stolonifera
red root	Wachendorfia thrysiflora
red shanks/ribbonwood	Adenostoma sparsifolium
red tubeflower	Iochroma fuchsioides
red valerian	Centranthus ruber
red/ yellow yucca	Hesperaloe parviflora
redberry	Rhamnus croceus
redwood violet	Viola sempervirens
Reeves skimmia	Skimmia reevesiana
reineckia	Reineckia carnea
rhagodia	Rhagodia deltophylla
rhododendron	Rhododendron spp.
rhodophiala	Rhodophiala bifida
ribbon bush	Hypoestes aristata
ribbon grass	Phalaris spp. (ornamental)
rice flower	Pimelea ferruginia
rice flower	Pimelea prostrata
rice paper plant	Tetrapanax papyrifer
Richmond begonia	Begonia 'Richmondensis'
rigidula acacia	Acacia rigidula
ring bellflower	Symphyandra spp.
river she-oak	Casuarina cunninghamiana
river/red birch	Betula nigra
rock cress	Aubrieta deltoidea
rock jasmine	Androsace lanuginosa
rock soapwort	Saponaria ocymoides
rock verbena	Verbena tenera (pulchella)
rockcress	Arabis spp.
rockrose	Cistus spp.
rogersia (aesculifolia)	Rodgersia aesculifolia
rogersia (pinnata)	Rodgersia pinnata
rohdea	Rohdea japonica
roscoea	Roscoea purpurea
rose	Rosa hybrids..bush
rose campion/crown pink	Lychnis coronaria
rose cone flower/drumsticks	Isopogon formosus
rose grass	Rhodohypoxis spp.
rose of Sharon	Hibiscus syriacus
roseleaf sage	Salvia involucrata
rosemary	Rosmarinus officinalis
round leaf mint bush	Prostanthera rotundifolia
Rowall hypericum	Hypericum 'Rowallane'
Roxburgh fig	Ficus auriculata
royal bluebell	Wahlenbergia gloriosa
royal climber	Oxera pulchella
royal purple autumn sage	Salvia muelleri
royal trumpet vine	Distictis 'Rivers'
royal/flowering fern	Osmunda regalis
rubber plant	Ficus elastica

COMMON NAME	BOTANICAL NAME
ruby grass	Rhynchelytrum neriglume
rush	Juncus spp.
Russell lupines	Lupinus (Russell hybrids)
Russian olive	Elaeagnus angustifolia
Russian sage	Perovskia spp.
rusty leaf fig	Ficus rubiginosa
Ryukyu Island palm	Arenga engleri
S. California black walnut	Juglans californica
sage (forskaohlei/hians)	Salvia forskaohlei (hians)
sage (glechomaefolia)	Salvia glechomaefolia
sage (iodantha)	Salvia iodantha
sage (jamensis cvs.)	Salvia X jamensis cvs.
sage (reptans)	Salvia reptans
sage (superba)	Salvia X superba hybrids & cvs.
sagebrush	Artemisia spp. (shrubby)
sago palm	Cycas revoluta
saguaro	Carnegiea gigantea
sakaki	Cleyera japonica
salal	Gaultheria shallon
Salt River mallet	Eucalyptus sargentii
saltbush	Atriplex spp.
San Clemente Island bush mallow	Malacothamnus clementinus
San Diego County viguiera	Viguiera laciniata
San Diego mountain mahogany	Cercocarpus minutiflorus
San Diego willowy mint	Monardella linoides ssp. viminea
San Jose hesper palm	Brahea brandegeei
San Miguel Mountain sage	Salvia munzii
San Miguel savory	Satureja chandleri
sandanqua viburnum	Viburnum suspensum
sandwort	Arenaria montana
Santa Cruz Island gooseberry	Ribes thacherianum
sapphire dragon tree	Paulownia kawakamii
Saratoga laurel	Laurus 'Saratoga'
Sargent cherry	Prunus sargentii
sasanqua camellia	Camellia sasanqua
saucer magnolia	Magnolia X soulangiana
savory	Satureja mexicana
saw leaf zelkova	Zelkova serrata
saxifrage	Saxifraga spp.
scarlet monardella	Monardella macrantha
scarlet oak	Quercus coccinea
scarlet red maple	Acer rubrum
scarlet sage	Salvia gesneriflora
Scotch elm	Ulmus glabra
Scotch heather	Calluna vulgaris
Scotch moss	Sagina subulata 'Aurea'
Scotch pine	Pinus sylvestris
screwbean mesquite	Prosopis pubescens
sea dahlia	Coreopsis maritima
sea foam	Holodiscus discolor
sea holly	Eryngium pandanifolium
sea holly	Eryngium variifolium
sea oats	Chasmanthium latifolium
sea pink	Armeria alliacea
sea pink	Armeria maritima
sea squill	Urginea maritima

COMMON NAME	BOTANICAL NAME
sea urchin tree	Hakea laurina
sedge	Carex (garden spp.)
self heal	Prunella spp.
semiaquilegia	Semiaquilegia ecalcarata
Senegal date palm	Phoenix reclinata
senna/cassia (odorata)	Senna odorata (Cassia odorata)
senna/cassia (spectabilis/excelsa)	Senna spectabilis (Cassia excelsa)
senna/cassia didymobotrya	Senna didymobotrya (Cassia didymobotrya)
sensitive fern	Onoclea sensibilis
Serbian bell flower	Campanula poscharskyana
Serbian spruce	Picea omorika
serissa	Serissa foetida
Shasta daisy	Leucanthemum X superbum
shaving brush	Pseudobomax ellipticum
sheild/wood fern	Dryopteris arguta
shell bush	Orthosiphon labiatus
shell ginger	Alpinia zerumbet
Sherwood dwarf abelia	Abelia 'Sherwoodii'
shiny xylosma	Xylosma congestum
showy banksia	Banksia speciosa
showy jasmine	Jasminum floridum
shrimp plant	Justicia brandegeana
shrub aster	Felicia fruticosa
shrub pincushion	Pterocephalus dumetorum
shrubby cassia	Cassia wizlizeni
shrubby dogweed	Dyssodia acerosa
Shumard red oak	Quercus shumardii
Siberian bugloss	Brunnera macrophylla
Siberian cypress	Microbiota decussata
Siberian elm	Ulmus pumila
Siberian iris	Iris spp.
Siberian wallflower	Erysimum hyeraciifolium
sideoats gramma	Bouteloua curtipendula
sideritis	Sideritis syriaca
Sierra sundrop	Calyophus hartwegii
silk oak	Grevillea robusta
silk tree	Albizia julibrissin
silver buffaloberry	Shepherdia argentea
silver button plant	Cotula lineariloba
silver cassia/senna	Senna phyllodenia (Cassia phyllodenia)
silver dichondra	Dichondra argenta
silver dollar gum	Eucalyptus polyanthemos
silver gimlet	Eucalyptus campaspe
silver lace vine	Polygonum aubertii
silver lupine	Lupinus albifrons
silver maple	Acer saccharinum
silver mountain gum	Eucalyptus pulverulenta
silver sage	Salvia argentea
silver spear	Astelia nervosa chathamica
silver tree	Leucadendron argenteum
silver vein creeper	Parthenocissus henryana
silver wattle	Acacia dealbata
silverberry	Elaeagnus pungens
silvery yarrow	Achillea clavennae
Sinaloan blue sage	Salvia sinaloensis
single leaf pinyon pine	Pinus monophylla

COMMON NAME	BOTANICAL NAME
sissoo	Dalbergia sissoo
sisysrinchium (convolutum)	Sisyrinchium convolutum
sisysrinchium (striatum)	Sisysrinchium striatum
sky flower	Duranta erecta (D. repens)
sky flower	Thunbergia grandiflora
slipper flower/slipperwort	Calceolaria spp.
small flowered clematis	Clematis pauciflora
Smith's brush cherry	Syzygium smithii
Smith's tecoma	Tecoma X smithii
smoke tree	Cotinus coggygria
smoke tree	Psorothamnus spinosa (Dalea spinosa)
smooth Arizona cypress	Cupressus arizonica var.glabra
snail vine	Vigna caracalla
snakeweed	Gutierrezia sarothrae
snapdragon vine	Asarina antirriniflora (Maurandya)
snow in summer	Cerastium tomentosum
snowball hydrangea	Hydrangea arborescens
snowberry	Symphoricarpus albus
snowdrop bush	Styrax officinale redivivus
snowdrop windflower	Anemone sylvestris
Snowy River wattle	Acacia boormanii
snowy woodrush	Luzula nivea
soapbark tree	Quillaja saponaria
society garlic	Tulbaghia violacea
soft muhly	Muhlenbergia pubescens
Soloman's seal	Polygonatum odoratum (japonicum)
Sonoma sage	Salvia 'Dara's Choice'
Sonora cercidium	Cercidium 'Sonorae'
Sonoran justicia	Justicia sonorea
Sonoran palo verde	Cercidium praecox
sorrel/shamrock	Oxalis spp.
sour gum/tupelo	Nyssa sylvatica
sourwood tree	Oxydendrum arboreum
South African jasmine	Jasminum angulare
South African mallow	Anisodontea X hypomadarum
southern live oak	Quercus virginiana
southern magnolia	Magnolia grandiflora
southern sword fern	Nephrolepis cordifolia
southwest redbud	Cercis reniformis
Spanish broom	Spartium junceum
Spanish fir	Abies pinsapo
Spanish oak	Quercus texana
Spanish shawl	Heterocentron elegans
Spanish/Dutch iris	Iris spp.
spathiphyllum	Spathiphyllum spp.
spear lily	Doryanthes palmeri
speedwell	Veronica repens
spicy jatropha	Jatropha integerrima
spiderwort	Tradescantia X andersoniana
spiderwort	Tradescantia pallida
spike sage	Salvia confertiflora
spiny headed mat rush	Lomandra longifolia
spiraea	Spiraea spp.
spotted deadnettle	Lamium maculatum
spotted emu bush	Eremophila maculata
spotted gum	Eucalyptus maculata

COMMON NAME	BOTANICAL NAME
spring cinquefoil	Potentilla neumanniana (tabernaemontani)
spring star flower	Ipheion uniflorum (Tritelia)
square-stemmed bamboo	Chimonobambusa quadrangularis
squawbush	Rhus trilobata
squirrel's foot fern	Davallia trichomanoides
St.Johnswort	Hypericum 'Hidecote'
staghorn sumac	Rhus typhina
stalked bulbine	Bulbine frutescens
standing cypress	Ipomopsis rubra
star jasmine	Trachelospermum jasminoides
star lily	Arthropodium cirrhatum
star magnolia	Magnolia stellata
statice	Goniolimon incanum (Limonium speciosum)
statice	Limonium perezii
stemless carline thistle	Carlina acaulis
stenomesson	Stenomesson variegatum
Stephan jasmine	Jasminum X stephanense
stokes aster	Stokesia laevis
stone crop	Sedum spp.
straw flower	Helichrysum bracteatum
straw flower	Plecostachys serpyllifolia (Helichrysum)
strawberry	Fragaria spp.
strawberry guava	Psidium littorale var. longipes
strawberry snowball	Dombeya cacuminum
strawberry tree	Arbutus unedo
Sturt's cassia/senna	Senna sturtii (Cassia sturtii)
subporosa acacia	Acacia subporosa
sugar bush	Rhus ovata
sugar gum	Eucalyptus cladocalyx
sugar maple	Acer saccharum
sugar scoop	Tiarella wherryi
summer holly	Arctostaphylos diversiloba (Comarostaphylis diversiloba)
summer hyacinth	Galtonia candicans
summer snow	Plumbago scandens
summer snowflake	Leucojum aestivum
summersweet	Clethra alnifolia
sun rose	Halimium lasianthum
sutera	Sutera spp.
swamp honey-myrtle	Melaleuca squamea
swamp jessamine	Gelsemium rankinii
swamp mahogany	Eucalyptus robusta
swamp mallee	Eucalyptus spathulata
swamp paper bark	Melaleuca rhaphiophylla
swamp sunflower	Helianthus angustifolius
swamp weed	Selliera radicans
Swan River daisy	Brachycome spp.
Swedish ivy	Plectranthus spp.
sweet acacia	Acacia farnesiana
sweet bay	Laurus nobilis
sweet box	Sarcococca confusa
sweet flag	Acorus gramineus
sweet garlic	Tulbaghia fragrans
sweet gum	Liquidambar styraciflua
sweet hakea	Hakea suaveolens
sweet olive/osmanthus	Osmanthus spp.
sweet pea shrub	Polygala X dalmaisiana

COMMON NAME	BOTANICAL NAME
sweet sarcococca	Sarcococca hookerana humilis
sweet shade	Hymenosporum flavum
sweet shade	Tetraneuris acaulis (Hymenoxis acaulis)
sweet vernal grass	Anthoxanthum odoratum
sweet viburnum	Viburnum odoratissimum
sweet violet	Viola odorata
sweet woodruff	Galium odoratum
switch grass	Panicum virgatum cvs.
switch grass	Panicum(native spp.)
sword fern	Polystichum californicum
Sydney golden wattle	Acacia longifolia
Sykes coral tree	Erythrina X sykesii
takil fan palm	Trachycarpus takil
tall aristea	Aristea major
tall baeckia	Baeckea virgata
tamarisk	Tamarix spp.
tanbark oak	Lithocarpus densiflorus
tansy	Tanacetum haradjanii
tarata	Pittosporum eugenioides
tarragon/angel's hair etc.	Artemisia spp. (herbaceous)
Tartarian statice	Gonilimon tataricum (Limonium tataricum)
Tasmanian tree fern	Dicksonia antarctica
tatarian honeysuckle	Lonicera tatarica
tawhiwhi	Pittosporum tenuifolium
tea tree	Leptospermum polygalifolium
tea tree	Leptospermum rotundifolium
tea tree	Leptospermum rupestre (humifusum)
tea viburnum	Viburnum setigerum
tecate cypress	Cupressus guadalupensis forbesii
tecomanthe	Tecomanthe speciosa
tenaza	Pithecellobium pallens
Texas ebony	Pithecellobium flexicaule
Texas firecracker bush	Hamelia patens
Texas mountain laurel	Sophora secundiflora
Texas needle grass	Nassella tenuissima
Texas olive	Cordia boissieri
Texas red oak	Quercus buckleyi
Texas sage	Salvia coccinea
Texas sycamore	Platanus occidentalis 'Glabrata'
thread leaf false aralia	Schefflera elegantissima (Dizygotheca)
threadleaf coreopsis	Coreopsis verticilata cvs.
thrift	Armeria caespitosa (A. juniperifolia)
thrift	Armeria setacea
throatwart	Trachelium caeruleum
thumbergia (mysorensis)	Thunbergia mysorensis
thunbergia (battiscombei)	Thunbergia battiscombei
thyme	Thymus spp.
thyme honey-myrtle	Melaleuca thymifolia
ti plant	Cordyline terminalis
tickseed	Bidens triplinervia
tiger grass	Thysanolaena maxima
tipu tree	Tipuana tipu
toad lily	Tricyrtis hirta
toadflax	Linaria purpurea
toadflax	Linaria supina
Tolleson's juniper	Juniperus scopulorum'Tolleson'

COMMON NAME	BOTANICAL NAME
toog	Bischofia javanica
torch cactus	Echinopsis spp. (Trichocereus spp.)
Torrey pine	Pinus torreyana
totara	Podocarpus totara
totem poles (lilac melaleuca)	Melaleuca decussata
tower of jewels	Echium wildpretii
toyon	Heteromeles arbutifolia
trailing daisy	Wedelia trilobata
trailing indigo bush	Dalea greggii
trailing lantana	Lantana montevidensis (sellowiana)
trailing rosemary	Rosemarinus 'Prostratus'
Transvaal daisy	Gerbera jamesonii
tree banksia	Banksia integrifolia
tree dahlia	Dahlia imperialis
tree euphorbia	Euphorbia lambii
tree ivy	X Fatshedera lizei
tree mallow	Lavatera assurgentiflora
tree of heaven	Ailanthus altissima
tree philodendron	Philodendron bipinnatifidum (selloum)
treebine	Cissus trifoliata
triangle palm	Neodypsis decaryi
triangleleaf bursage	Ambrosia deltoidea
trident maple	Acer buergerianum
trinidad flame bush	Calliandra tweedii
tritonia	Tritonia spp.
trixis	Trixis californica
true myrtle	Myrtus communis
trumpet creeper	Campsis spp.
trumpet honeysuckle	Lonicera sempervirens
tuberose	Polyanthes tuberosa
tufted (white) evening primrose	Oenothera caespitosa
tufted hairgrass	Deschampsia caespitosa
tulip tree	Liriodendron tulipifera
tulipwood	Harpullia arborea
Turk's cap	Malvaviscus arboreus
turpentine bush	Ericameria laricifolia (Haplopappus)
Turutu	Dianella intermedia
twinspur	Diascia spp.
twisted acacia	Acacia schaffneri
umbrella bamboo	Thamnocalamus spathaceus (Fargesia murieliae)
umbrella catalpa	Catalpa bungei
umbrella plant/Indian rhubarb	Darmera peltata
umbrella sedge/papyrus	Cyperis spp.
valley oak	Quercus lobata
Vancouver gold genista	Genista pilosa (Vancouver Gold)
veitch magnolia	Magnolia X veitchii
velvet centaurea	Centaurea gymnocarpa
velvet honeysuckle	Dicliptera suberecta
velvet mesquite	Prosopis velutina
velvet slipper	Sinningia tubiflora
verbena (bonariensis)	Verbena bonariensis
verde vista coprosma	Coprosma petriei 'Verde vista'
veronica	Veronica spp.
veronica/speedwell	Parahebe spp.
vervian	Verbena rigida
viburnum (rhytidophylloides)	Viburnum X rhytidophylloides

COMMON NAME	BOTANICAL NAME
victorian box	Pittosporum undulatum
victorian dogwood	Prostanthera lasianthos
villebrunea	Villebrunea pedunculata
vine maple	Acer circinatum
vining bluebell	Sollya parvifolia
violet (japonica)	Viola japonica
violet trumpet vine	Clytostoma callistigioides
violet tubeflower	Iochroma cyanea
violet westringia	Westringia glabra
Virginia creeper	Parthenocissus quinquefolia
wallflower	Erysimum cheiri (Cherianthus cheiri)
wallflower	Erysimum helveticum
wallflower	Erysimum linifolium
wallflower	Erysimum menziesii
wallflower	Erysimum pulchellum
wandering Jew	Tradescantia fluminensis
waratah	Telopea speciosissima
Warley rose stone cress	Aethionema armenium 'Warley Rose'
water birch	Betula fontinalis (occidentalis)
water dropwort	Oenanthe javanica
watsonia	Watsonia spp.
Waverly sage	Salvia 'Waverly'
Wax begonia	Begonia semperflorens
weeping acacia	Acacia pendula
weeping bottle brush	Callistemon viminalis
weeping Chinese banyan	Ficus benjamina
weigelia	Weigela florida
Wenlock beauty wallflower	Erysimum 'Wenlock Beauty'
western Australia coral pea	Hardenbergia comptoniana
western catalpa	Catalpa speciosa
western cottonwood	Populus fremontii
western dog violet	Viola adunca
western dogwood	Cornus nuttallii
western hackberry	Celtis reticulata
western hazelnut	Corylus cornuta californica
western redbud	Cercis occidentalis
western spice bush	Calycanthus occidentalis
western sword fern	Polystichum munitum
western virgin's bower	Clematis ligusticifolia
westringia (longifolia)	Westringia longifolia
white alder	Alnus rhombifolia
white ash	Fraxinus americana
white barked Himalayan birch	Betula utilis var. jaquemontii
white breath of heaven	Coleonema album
white bursage	Ambrosia dumosa
white clover	Trifolium repens
white Florida anise-tree	Illicium floridanum 'Alba'
white floss silk tree	Chorisia insignis
white flowering currant	Ribes indecorum
white fringe tree	Chionanthus virginicus
white ginger lily	Hedychium coronarium
white ironbark	Eucalyptus leucoxylon
white mulberry	Morus alba
white rock rose	Helianthemum appenium
white sage	Salvia apiana
white sapote	Casimiroa edulis

COMMON NAME	BOTANICAL NAME
white striped dwarf bamboo	Sasaella masamuniana albostriata
white weigela	Weigela coraeensis
whitethorn acacia	Acacia constricta
whorlflower	Morina longifolia
wild ginger	Asarum caudadum
wild hyacinth	Dichelostemma capitatum
wild mock orange	Philadelphus lewisii californicus
wild rye	Elymus spp. (also see Leymus spp.)
wild rye	Leymus spp. (also see Elymus spp.)
willow	Salix spp.
willow acacia	Acacia salicina
willow pittosporum	Pittosporum phillyraeoides
Wilson holly	Ilex X altaclarensis 'Wilsonii'
Wilson melaleuca	Melaleuca wilsonii
windmill palm	Trachycarpus fortunei
winter blooming bergenia	Bergenia crassifolia
winter creeper	Euonymus fortunei radicans
winter daphne	Daphne odora
winter hazel	Corylopsis spicata
winter jasmine	Jasminum nudiflorum
winter sweet pea	Swainsonia galegifolia
winterberry	Ilex verticillata
winter's bark	Drimys winteri
wintersweet	Chimonanthus praecox
wire-netting bush	Corokia cotoneaster
wishbone bush	Mirabilis california
wisteria	Wisteria spp.
wolfberry	Lycium fremontii
wong-lan	Michelia doltsopa
wonga wonga vine	Pandorea pandorana
wood fern	Dryopteris erythrosora
woolly bush	Adenanthos drummondii
woolly bush	Adenanthos sericea
woolly butterfly bush	Buddleja marrubiifolia
woolly yarrow	Achillea tomentosa
woolly/mountain blue curls	Trichostema lanatum
wooly senna	Senna multiglandulosa (Cassia tomentosa)
wrinkled agastache	Agastache rugosa
Wynyabbie gem westringia	Westringia 'Wynyabbie Gem'
yaupon	Ilex vomitoria
Yeddo hawthorne	Rhaphiolepis umbellata
yellow archangel	Lamiastrum galeobdolon
yellow bells	Tecoma stans
yellow ginger	Hedychium flavescens
yellow mallow	Pavonia praemorsa
yellow oleander	Thevetia peruviana
yellow orchid vine	Mascagnia macroptera
yellow penstemmon	Keckiella antirhinnoides
yellow plume flower	Justicia aurea
yellow trumpet vine	Anemopaegma chamberlaynii
yellow waxbells	Kirengeshoma koreana
yellow waxbells	Kirengeshoma palmata
yellow wood	Podocarpus latifolius
yerba buena	Satureja douglasii
yerba mansa	Anemopsis californica
yesterday today and tomorrow	Brunfelsia pauciflora

COMMON NAME	BOTANICAL NAME
Yew (media cvs.)	Taxus X media cvs.
yew pine	Podocarpus macrophyllus
York gum	Eucalyptus loxophleba
yucca	Yucca spp.
zaluzinskya	Zaluzianskya katherinae
zebra rush	Schoenoplectus lacustris var.tabernaemontani
zephyr flower	Zephryranthes spp.
zexmenia	Zexmenia hispida

Turfgrasses

Grass	Type	Irrigation Requirements
annual bluegrass	cool season	80% of ET_o
annual ryegrass	cool season	80% of ET_o
Bermudagrass	warm season	60% of ET_o
colonial bentgrass	cool season	80% of ET_o
creeping bentgrass	cool season	80% of ET_o
hard fescue	cool season	80% of ET_o
highland bentgrass	cool season	80% of ET_o
Kentucky bluegrass	cool season	80% of ET_o
kikuyugrass	warm season	60% of ET_o
meadow fescue	cool season	80% of ET_o
perennial ryegrass	cool season	80% of ET_o
red fescue	cool season	80% of ET_o
rough-stalked bluegrass	cool season	80% of ET_o
seashore paspalum	warm season	60% of ET_o
St. Augustinegrass	warm season	60% of ET_o
tall fescue	cool season	80% of ET_o
zoysiagrass	warm season	60% of ET_o

From: University of California ANR publication 24191, *Turfgrass Evapotranspiration Map, Central Coast of California*.

Appendix A— Reference Evapotranspiration Values for Selected Locations in California

Table 1 gives monthly average values for reference evapotranspiration (ET_o) in selected California locations. All values are reported in inches per day.

To calculate inches per month, select a location in the column on the left, then select a month and read the value corresponding to the location. Multiply the column value times the number of days in the month. For example, reference evapotranspiration in Sacramento for the month of August is 7.75 inches (.25 x 31 = 7.75).

The numbers in Appendix A are normal year (historical) averages, derived from several years of data for the month and location. Adjustments to normal year values may be needed to account for:

1. Variation in actual ET_o totals for a month. From year to year the actual amount of evaporation may be substantially different than the historical average. For example, the historical average ET_o for August in Sacramento is 7.75 inches. If the summer was particularly cool, however, the actual value may be 25% less than average, or about 5.8 inches. Conversely, the actual amount may be substantially greater during a very hot summer. Adjustments to reflect actual ET_o conditions will be appropriate in some years.

2. Variation in location. Adjustments in ET_o may be needed for the location of the landscape planting. The climatic conditions at the ET_o measuring site may be substantially different than those at the landscape site. For example, San Francisco does not have a CIMIS station. CIMIS stations closest to San Francisco are in Marin County and San Mateo County. To use data from either Marin or San Mateo for San Francisco, a downward adjustment in ET_o would be needed since both locations are considerably warmer than San Francisco. It is important to know

Reference evapotranspiration (ET_o) values are collected at various sites in California. The ETo site closest to your location may or may not have climatic conditions similar to your site. If not, then adjusments in ET_o values will be needed. For example, using Marin County or San Mateo County data for San Francisco will likely produce an overestimate of landscape water needs.

where ET_o measurements are being taken and then decide whether meaningful differences exist between your location and the measurement location. The assistance of a qualified biometeoroligist is recommended if adjustments for location are needed.

Appendix A—Table 1
Reference Evapotranspiration Rates for Selected Cities*

Daily Average Reference Evapotranspiration by ET_o Zone (inches per day)

ET_o Zone	City	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1	Santa Monica	0.03	0.05	0.08	0.11	0.13	0.15	0.15	0.13	0.11	0.08	0.04	0.02
2	Santa Cruz	0.04	0.06	0.10	0.13	0.15	0.17	0.16	0.15	0.13	0.09	0.06	0.04
3	Monterey/Salinas	0.06	0.08	0.12	0.16	0.17	0.19	0.18	0.17	0.14	0.11	0.08	0.06
4	San Diego	0.06	0.08	0.11	0.15	0.17	0.19	0.19	0.18	0.15	0.11	0.08	0.06
5	Santa Rosa	0.03	0.06	0.09	0.14	0.18	0.21	0.21	0.19	0.15	0.10	0.05	0.03
6	Los Angeles	0.06	0.08	0.11	0.16	0.18	0.21	0.21	0.20	0.16	0.12	0.08	0.06
7	Alturas	0.02	0.05	0.08	0.13	0.17	0.21	0.24	0.21	0.16	0.09	0.04	0.02
8	San Jose	0.04	0.06	0.11	0.16	0.20	0.23	0.24	0.21	0.17	0.11	0.06	0.03
9	San Bernardino Pasadena	0.07	0.10	0.13	0.17	0.19	0.22	0.24	0.22	0.19	0.13	0.09	0.06
10	Paicines	0.03	0.06	0.10	0.15	0.19	0.24	0.26	0.23	0.17	0.10	0.05	0.03
11	Sonora	0.05	0.08	0.10	0.15	0.19	0.24	0.26	0.24	0.19	0.12	0.07	0.05
12	Fresno	0.04	0.07	0.11	0.17	0.22	0.26	0.26	0.23	0.18	0.12	0.06	0.03
13	Quincy	0.04	0.07	0.10	0.16	0.21	0.26	0.29	0.25	0.19	0.12	0.06	0.03
14	Sacramento	0.05	0.08	0.12	0.17	0.22	0.26	0.28	0.25	0.19	0.13	0.07	0.05
15	Bakersfield	0.04	0.08	0.12	0.19	0.24	0.27	0.28	0.25	0.19	0.13	0.07	0.04
16	Hanford	0.05	0.09	0.13	0.19	0.25	0.29	0.30	0.27	0.21	0.14	0.08	0.05
17	Needles	0.06	0.10	0.15	0.20	0.26	0.30	0.32	0.28	0.22	0.14	0.09	0.06
18	Palm Springs	0.08	0.12	0.17	0.23	0.28	0.32	0.31	0.28	0.23	0.16	0.10	0.07

* For comprehensive descriptions of each zone and to locate your region in a zone, see the California Irrigation Management Information System (CIMIS) color map opposite this page.

California Irrigation Management Information System (CIMIS)
REFERENCE EVAPOTRANSPIRATION ZONES

Reference EvapoTranspiration (ETo) Zones

- **1** COASTAL PLAINS HEAVY FOG BELT lowest ETo in California, characterized by dense fog
- **2** COASTAL MIXED FOG AREA less fog and higher ETo than zone 1
- **3** COASTAL VALLEYS & PLAINS & NORTH COAST MOUNTAINS more sunlight than zone 2
- **4** SOUTH COAST INLAND PLAINS & MOUNTAINS NORTH OF SAN FRANCISCO more sunlight and higher summer ETo than zone 3
- **5** NORTHERN INLAND VALLEYS valleys north of San Francisco
- **6** UPLAND CENTRAL COAST & LOS ANGELES BASIN higher elevation coastal areas
- **7** NORTHEASTERN PLAINS
- **8** INLAND SAN FRANCISCO BAY AREA inland area near San Francisco with some marine influence
- **9** SOUTH COAST MARINE TO DESERT TRANSITION inland area between marine & desert climates
- **10** NORTH CENTRAL PLATEAU & CENTRAL COAST RANGE cool, high elevation areas with strong summer sunlight; zone has limited climate data & the zones selection is somewhat subjective
- **11** CENTRAL SIERRA NEVADA mountain valleys east of Sacramento with some influence from delta breeze in summer
- **12** EAST SIDE SACRAMENTO-SAN JOAQUIN VALLEY low winter & high summer ETo with slightly lower ETo than zone 14
- **13** NORTHERN SIERRA NEVADA northern Sierra Nevada mountain valleys with less marine influence than zone 11
- **14** MID-CENTRAL VALLEY, SOUTHERN SIERRA NEVADA, TEHACHAPI & HIGH DESERT MOUNTAINS high summer sunshine and wind in some locations
- **15** NORTHERN & SOUTHERN SAN JOAQUIN VALLEY slightly lower winter ETo due to fog and slightly high summer ETo than zones 12 & 14
- **16** WESTSIDE SAN JOAQUIN VALLEY & MOUNTAINS EAST & WEST OF IMPERIAL VALLEY
- **17** HIGH DESERT VALLEYS valleys in the high desert near Nevada and Arizona
- **18** IMPERIAL VALLEY, DEATH VALLEY & PALO VERDE low desert areas with high sunlight & considerable heat advection

Appendix A—Table 2
Calculations of Species Water Needs for July for Several Locations in California

Listed are normal year ET_o values[1] for July and three categories of water needs. Select the appropriate location and water need category. Look down the column to find the estimated water need. This was calculated by multiplying ET_o x a water need category (low, medium or high). For example, for Los Angeles in July, the normal year ET_o = 6.5 inches. For a planting in the medium category, (0.4 - 0.6) the estimated water need ranges from 2.6 to 3.9 inches.

Estimated species water needs (inches per month)[2] for JULY

ET_o Zones	WUCOLS REGION	ET_o	LOW 0.1	LOW 0.2	LOW 0.3	MEDIUM 0.4	MEDIUM 0.5	MEDIUM 0.6	HIGH 0.7	HIGH 0.8	HIGH 0.9
	NORTH CENTRAL										
4	Novato	5.8	0.6	1.1	1.7	2.3	2.9	3.4	4.0	4.6	5.2
1, 2	San Francisco	4.6-4.9	0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.9	4.4
8	Concord	7.4	0.7	1.4	2.2	2.9	3.7	4.4	5.1	5.9	6.6
8	San Jose	7.4	0.7	1.4	2.2	2.9	3.7	4.4	5.1	5.9	6.6
3	Monterey	5.5	0.5	1.0	1.6	2.2	2.7	3.3	3.8	4.4	4.9
6	San Luis Obispo	6.5	0.6	1.3	1.9	2.6	3.2	3.9	4.5	5.2	5.8
	CENTRAL VALLEY										
14	Auburn	8.6	0.9	1.7	2.5	3.4	4.3	5.1	6.0	6.8	7.7
14	Sacramento	8.6	0.9	1.7	2.5	3.4	4.3	5.1	6.0	6.8	7.7
12	Modesto/Stockton	8.0	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.4
12	Fresno	8.0	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.4
15	Bakersfield	8.6	0.9	1.7	2.5	3.4	4.3	5.1	6.0	6.8	7.7
14	Redding	8.6	0.9	1.7	2.5	3.4	4.3	5.1	6.0	6.8	7.7
	SOUTH COASTAL										
4	Santa Barbara	5.8	0.6	1.1	1.7	2.3	2.9	3.4	4.0	4.6	5.2
4	Ventura	5.8	0.6	1.1	1.7	2.3	2.9	3.4	4.0	4.6	5.2
6	Los Angeles	6.5	0.6	1.3	1.9	2.6	3.2	3.9	4.5	5.2	5.8
1, 2	Laguna Beach	4.7-4.9	0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.9	4.4
4	San Diego	5.8	0.6	1.1	1.7	2.3	2.9	3.4	4.0	4.6	5.2
	SOUTH INLAND VALLEY										
9	San Fernando	7.4	0.7	1.4	2.2	2.9	3.7	4.4	5.1	5.9	6.6
9	Pasadena	7.4	0.7	1.4	2.2	2.9	3.7	4.4	5.1	5.9	6.6
9	Riverside	7.4	0.7	1.4	2.2	2.9	3.7	4.4	5.1	5.9	6.6
9	Ramona	7.4	0.7	1.4	2.2	2.9	3.7	4.4	5.1	5.9	6.6
9	San Bernardino	7.4	0.7	1.4	2.2	2.9	3.7	4.4	5.1	5.9	6.6
	HIGH DESERT										
17	Palmdale	9.9	1.0	1.9	2.9	3.9	4.9	5.9	6.9	7.9	8.9
17	Lancaster	9.9	1.0	1.9	2.9	3.9	4.9	5.9	6.9	7.9	8.9
17	Victorville	9.9	1.0	1.9	2.9	3.9	4.9	5.9	6.9	7.9	8.9
17	Bishop	9.9	1.0	1.9	2.9	3.9	4.9	5.9	6.9	7.9	8.9
17	Independence	9.9	1.0	1.9	2.9	3.9	4.9	5.9	6.9	7.9	8.9
	LOW DESERT										
18	Palm Springs	9.6	1.0	1.9	2.8	3.8	4.8	5.7	6.7	7.6	8.6
18	Coachella	9.6	1.0	1.9	2.8	3.8	4.8	5.7	6.7	7.6	8.6
18	Needles	9.6	1.0	1.9	2.8	3.8	4.8	5.7	6.7	7.6	8.6
18	El Centro	9.6	1.0	1.9	2.8	3.8	4.8	5.7	6.7	7.6	8.6

1. Normal year values and zones are derived from the ***California Irrigation Management Information System (CIMIS) Reference Evapotranspiration Map***, 1999.
2. Please note; these values are not adjusted for irrigation efficiency.

Appendix B— Invasive Species

Certain species, if grown adjacent to wildland areas, have the ability to "invade" native habitats to the detriment of the native species. Others cause problems in managed landscapes. Species of both types are listed here. It is incumbent on landscape architects, designers, and managers to learn which plants are considered to be invasive, and use appropriate caution in their use.

Invasive species are indicated on the list by ☹☹, or ☹.

Examples:

☹☹ *Arundo donax*

Considered an important wildland weed (can displace native species in natural communities in one or more regions).

☹ *Acacia decurrens*

Considered a wildland weed of secondary importance, or is potentially invasive, or is a species which is limited to one region, landscaped areas or roadsides.

☹☹ *Genista spp*.

NOT ALL *Genista* species are considered invasive. Refer to "Notes on Invasive Species" for information about *Genista monspessulanus* French broom.

Notes on Invasive Species

Acacia baileyana—mainly near habitations
Acacia dealbata—Northern coastal to southern inland regions
Acacia decurrens—Northern coastal
Acacia longifolia—Minor threat along coast
Acacia melanoxylon—Northern coastal and inland to southern coastal
Achillea millefolium—Coastal and inland areas in moist places
Ailanthus altissima—Urban and natural areas around the world
Albezia distachya—Coastal areas
Aptenia cordifolia 'Red Apple'—Coastal zones, mainly southern
Arctotheca calendula—Northern and southern coastal bluffs, foothills
Arundo donax—All regions in moist areas, seasonal water courses
Atriplex glauca—Southern coastal foothills
Altriplex semibaccata - Coastal to inland areas
Briza media - Grasslands
Carpobrotus edulis —Coastal and inland regional throughout California
Carpobrotus chilensis — Coastal and inland regional throughout California
Centranthus ruber—Coastal, inland and foothill regions throughout California
Cistus ladanifer—coastal sage scrub and chaparral
Coprosma repens—Only coastal
Cordyline australis—Only coastal
Cortaderia sellowana—Coastal regions, dunes, scrub and Monterey pine forest
Cotoneaster pannosus—Disturbed sites, many communities, central and northern coast
Crataegus monogyna—Central and northern coast
Cupressus macrocarpa—Northern coastal
Cytisus canariensis—Foothill regions, northern California and Central Valley
Cytisus racemosus—Foothill regions, northern California and Central Valley
Cytisus scoparius—Coastal scrub, oak woodland
Cytisus striatus—Coastal scrub, oak woodland
Delosperma spp. —Potential threat on coast
Duchesnia indica—Potential threat on coast
Echium candicans (fastuosum)—Coastal
Elaeagnus angustifolia—interior riparian areas
Erica lusitanica—possible threat to wildlands
Eucalyptus camaldulensis—Southern coastal canyons and foothills
Eucalyptus globulus—Coastal canyons and foothills, riparian areas
Eucalyptus pulverulenta—Southern coastal
Ficus carica—Central Valley, south coastal and Channel Islands riparian woodlands
Genista monspessulanus—Coastal scrub, oak woodland

Hedera canariensis—Coastal and inland regions in moist and shady places
Hedera helix—Coastal and inland regions in moist and shady places
Helichrysum petiolare—north coastal scrub
Ilex aquifolium—Coastal forests
Imperata cylindrica, I brasiliensis—on federal noxious weed list
Juncus spp.—potential to naturalize moist areas
Ligustrum lucidum—Mendocino coast
Limonium perezii—Southern coastal beaches and bluffs
Lonicera japonica 'Halliana'—Coastal and inland regions; moist, shady places
Lotus corniculatus—Roadside weed
Lupinus arboreus—North coast dunes
Lysimachia nummularia—widely naturalized in other states, not in CA to date
Malephora crocea—south coast bluffs, margins of wetlands
Melaleuca viridifolia (quinqueneveria)—severe problem in Florida wetlands, not in CA to date
Mentha pulegium—invades Santa Rosa Plain (Sonoma County)
Myoporum laetum—Northern and southern coastal foothills
Myosotis spp.—Coastal forests
Nereum oleander—Riparian areas
Oenanthe javanica—potential to naturalize in damp habitats
Olea europaea—Southern coastal and inland foothills
Pennisetum setaceum—All dry climate regions, grasslands, desert canyons
Phalaris aquatica—coastal sites with moist soil
Phyla nodiflora—Wet places, vernal pools
Pinus pinaster—Sparingly naturalized central coast
Pinus pinea—Sparingly naturalized central coast
Pinus radiata—Central and northern coastal
Pyracantha spp.—Central coastal
Robinia pseudoacacia—Northern valleys and foothills to southern mountains and foothills
Sapium sebiferum—severe problem in Gulf coast wetlands, bottomland forests, beginning to appear in CA in wetlands in Yolo county and along the American River near Sacramento
Schinus mole—Coastal canyons and foothills statewide
Schinus terebinthifolius—Coastal lowlands, wet places
Spartium junceum—Coastal scrub, oak woodlands
Tamarix chinensis, T gallica, T parviflora, T ramosissima (pendantra)—Coastal through desert riparian areas
Tropaeolum majus —Moist coastal regions
Vinca major—Riparian areas, oak woodland, mostly coastal
Watsonia bulbillifera—North coast
Watsonia marginata—North coast
Zantedeschia aethiopica—Coastal streams

Appendix C— Glossary

Acre-foot
The amount of water which covers an acre (43,560 $ft.^2$) to the depth of one foot (12 inches). One acre-foot equals 325,850 gallons.

CIMIS
California Irrigation Management Information System. A network of weather stations located around the state which collects reference evapotranspiration data. The network is managed by the California Department of Water Resources.

Conversion Factor (0.62 gallons/ft. 2-inch)
Used to convert water volume from inches per unit area to gallons per unit area. There are 0.62 gallons in a square foot-inch.

Crop Coefficient (K_c)
Fraction of water lost from the crop relative to reference evapotranspiration.

Crop Evapotranspiration (ET_o)
Water loss from a crop.

Vegetation Density
An evaluation of vegetation surface area per unit volume taking into consideration factors such as tree canopy cover and tiers of vegetation.

Density Factor (k_d)
One of three factors used to generate a landscape coefficient. Adjusts the landscape coefficient to account for the effect of vegetation density on water loss from a hydrozone.

ET
Evapotranspiration. The sum of water losses through evaporation (E) from the soil and transpiration (T) from the plant.

ET_o
Reference Evapotranspiration. The approximation of water loss from a field of 4-to-7-inch-tall cool-season grass that is not water stressed. ET_o is measured at CIMIS weather stations in various locations around the state.

ET_L
Estimated water needs of the landscape. Calculated by multiplying the landscape coefficient (K_L) by Reference Evapotranspiration (ET_o).

Hydrozone
A portion of a landscaped area having plants with similar water needs that are served by one irrigation valve or set of valves with the same schedule.

Irrigation Efficiency
A measure of the portion of the total applied irrigation water beneficially used (primarily to satisfy plant water needs). Losses (non-beneficial water use) include unused runoff and evaporation from wet soil surfaces.

Landscape Coefficient (K_L)
The functional equivalent of the crop coefficient. Used for estimating water needs from landscape plantings. Landscape coefficient = species factor x microclimate factor x density factor.

Microclimates
Areas having different environmental conditions within a climatic zone.

Microclimate Factor (k_{mc})

One of three factors used to generate a landscape coefficient. Adjusts the landscape coefficient to account for the effect of microclimate on water loss from a hydrozone.

Species Factor (k_s)

One of three factors used to generate a landscape coefficient. Adjusts the landscape coefficient to account for water loss from a hydrozone due to the plant species composition.

Square foot-inch

The amount of water which covers one square foot of area to the depth of one inch. One square foot-inch equals 0.62 gallons.

TWA

Total water applied. An estimate of the total amount of water to apply to a landscape planting. Calculated by dividing ET_L (estimated water needs of the planting) by IE (irrigation efficiency).

WUCOLS

Water Use Classification of Landscape Species. A Guide to the Water Needs of Landscape Plants.

Appendix D— Additional Resources

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Other Resources

- California Department of Water Resources
  Office of Water Use Efficiency
  901 P Street
  P. O.Box 942836
  Sacramento, California 94236-0001
  (916) 651-9676
  www.owue.water.ca.gov

- California Irrigation Management Information System (CIMIS)
  California Department of Water Resources
  Office of Water Use Efficiency
  P. O. Box 942836
  Sacramento, California 94236-0001
  (916) 651-7030
  www.cimis.water.ca.gov

- California Department of Water Resources Information: (800) 272-8869

- Species list on the Internet:
  www.dpla.water.ca.gov/urban/conservation/landscape/wucols/wucols.html

- Integrated Pest Management
  www.ipm.ucdavis.edu

- University of California Cooperative Extension
  San Mateo and San Francisco Counties
  625 Miramontes Street, Suite 200
  Half Moon Bay, California 94019
  (650) 726-9059

- UC Cooperative Extension—County Offices
  (check local phone directory)

Additions

Additions to the WUCOLS list can be made. Submit species names to:

Irrigation Water Needs Project
UCCE
625 Miramontes, Suite 200
Half Moon Bay, California 94019

Submitted names will be sent out for evaluation by committee members and additions will be made periodically.

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