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Treatment Program for Light Brown Apple Moth in Santa Cruz and Northern Monterey Counties, California

Environmental Assessment, September 2007

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I. Introduction

A. Biology of Light Brown Apple Moth

The light brown apple moth (LBAM) (*Epiphyas postvittana*) is native to Australia where it is an economically important pest on many fruit crops. The LBAM attacks a wide variety of plants. A recently compiled LBAM host list (USDA, 2007a; see appendix A) indicates there are at least 2,042 different plants that are reported to be hosts of LBAM. The list includes numerous native plants, forest species, and over 200 agronomically important crops (appendix A). In addition to Australia, LBAM has also been found in New Zealand, New Caledonia, Hawaii, and the British Isles.

The moth lays eggs in overlapping masses, preferably on leaves, but also on fruit and stems of the host plant. The larvae hatch and then pass through six stages of growth reaching approximately 18 millimeters (mm) in length before pupation. Young larvae are pale yellow while the mature larvae are pale green (Mo, 2006). Larvae will feed on leaves and fruit from susceptible host plants. In all stages, larvae will construct silken shelters at the feeding site which is where pupation occurs. Both female and male adults are light brown in color. The females are distinguished by a dark spot in the center of the front wings when folded. The number of LBAM generations produced in a growing season varies from one to over four, depending on environmental conditions (Danthanarayana, 1983; Mo et al., 2006), although the climate in California may allow four to five generations to occur in the infested counties. In cases where multiple generations occur in a season, the population can build to economically important thresholds quickly.

B. History of Infestation in California

The California Department of Food and Agriculture (CDFA) was notified on February 6, 2007, that LBAM had been found in 2006 and subsequently identified by an Australian expert from a site near Berkeley in Alameda County, California. This initiated CDFA trapping which resulted in the finding of additional moths beginning February 27. On March 16, 2007, the Agriculture Research Service Systematic Entomology Laboratory in Washington, DC confirmed that the original find was positive for LBAM. In response, pheromone-baited traps were placed in Alameda and Contra Costa Counties to determine where LBAM populations existed in the area. On April 20, 2007, CDFA issued a quarantine of at least 182-square miles in Alameda, Contra Costa, San Francisco, Marin, and Santa Clara Counties.

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS) issued a Federal quarantine order on May 2, 2007, requiring trapping, inspection, and certification of all nursery stock and host commodities from quarantine areas. The original quarantine area consisted of only eight counties. Today the quarantine area includes the following counties: Alameda, Contra Costa, Los Angeles, Marin, Monterey, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, and Solano. The quarantine area will continue to expand if LBAM is identified in new counties.

Since March 2007, more than 41,000 traps have been placed throughout California and approximately 8,000 moths have been confirmed as LBAM (CDFA, 2007a). Most of the captures (99 percent), however, are from traps located in two specific geographical areas. The first area, representing 87 percent of all LBAM captures, encompasses southern Santa Cruz and northern Monterey Counties. The second area, which represents approximately 12 percent of captures, includes contiguous portions of northwest Alameda, western Contra Costa, and northern San Francisco Counties. The remaining 1 percent came from mostly single trap captures in Los Angeles, Marin, Napa, San Mateo, Santa Clara, and Solano Counties.

In May, 2007, APHIS convened a group of international scientific experts (the Technical Working Group or TWG) to provide recommendations on short- and long-term plans to contain, control, and eradicate LBAM in California. The TWG toured the infested region on May 16 and concluded with a 2-day meeting in San Jose, California. They evaluated the distribution of LBAM and suggested treatment options for isolated areas and the main population areas. The recommendation of TWG was to prevent LBAM from spreading by first containing and eradicating LBAM from the outer edges of its range, and then eliminating the core population centers.

CDFA and APHIS started treatment of isolated populations in June 2007. To date, isolated populations in Napa, Oakley, Danville, Dublin, Sherman Oaks, San Jose, and Vallejo have been treated with pheromone twist ties, a mating disruption technique. The areas of Napa and Oakley also were treated with three ground applications of *Bacillus thuringiensis kurstaki* (Btk), a biologically based pesticide that is effective against early larval stages of most lepidopterans prior to the use of the pheromone twist ties.

Trapping results indicated that populations in the area from the Salinas River south to the Monterey Peninsula were growing and, if left

unchecked, could become an extension of the more heavily populated area around Soquel and southern Santa Cruz. In an effort to constrict this growth, the area from Marina and Seaside southward to and including most of the Monterey Peninsula was aeri ally treated on four consecutive nights beginning on the night of September 9 and ending in the early morning hours of September 13, 2007, with microencapsulated pheromone to disrupt LBAM mating. The total treatment area was approximately 36,500 acres. A second treatment of this area is anticipated after 30 days (the effective life of the microencapsulated pheromone once it has been applied). This treatment is currently scheduled to begin on or about October 9. Pheromone traps are in place and will remain throughout the treatment period and beyond to measure LBAM populations. This information will be used to evaluate the effectiveness of the treatments and for determining what additional treatments will be made to complete eradication efforts in this area.

C. Purpose and Need

APHIS is responsible for taking actions to exclude, eradicate, and/or control plant pests under the Plant Protection Act (7 United States Code (U.S.C.) 7701 et seq.). Therefore, it is important that APHIS take the steps necessary to eradicate LBAM from areas in California to prevent its spread to susceptible host plants throughout the United States.

Since LBAM is a new pest to the North American Continent, there is little information about how the moths will respond to treatment. The lack of experience with LBAM has made it difficult to determine the best eradication approach to take in California: therefore, the recommendations of TWG, several of whose members have direct experience with control of LBAM in Australia and New Zealand, has been especially welcomed. Based upon their recommendations, the current eradication efforts have mainly relied on mating disruption with different types of pheromone treatments.

The Santa Cruz-northern Monterey County population of LBAM is the largest in the State. Trapping results from here account for approximately 87 percent of all LBAM trapped to date (CDFA, 2007a). These moths are expected to remain active into November, and perhaps beyond, depending upon the weather conditions at local sites. A delay in treating this population is likely to result in an increased number of moths overwintering; therefore, it is desirable to begin treatments as early as possible since the pheromone is most efficacious when populations are low. The timing of applications to maximize efficacy based on the biology of LBAM is consistent with

integrated pest management strategies for controlling pests. It is expected that at the sometime around the end of October or beginning of November, the supplies of the pheromone will be sufficient to treat approximately 60,000 acres (see appendix B). Rather than waiting until next year, being able to provide a mating disruption treatment to the most populous LBAM center this year is expected to be more advantageous to the overall eradication efforts.

The remaining population center near San Francisco is less dense and, therefore, of less immediate concern. Treatment in this area will likely begin in spring 2008, after an assessment of this year's treatments has been completed.

Three environmental assessments (EAs) have been completed as areas have been designated for treatment. Those EAs include: Eradication of Isolated Populations of Light Brown Apple Moth in California, June 2007(USDA, 2007b); Eradication of Isolated Populations of Light Brown Apple Moth in California, Revised Environmental Assessment, July 2007 (USDA, 2007c); and, Treatment of Light Brown Apple Moth in the Seaside Area in California, Environmental Assessment, July 2007 (USDA, 2007d). These EAs are incorporated into this EA by reference.

This EA will analyze the environmental impacts anticipated from the proposed pheromone treatment of LBAM in Santa Cruz and northern Monterey Counties (see appendix B).

This EA has been prepared consistent with the National Environmental Policy Act of 1969 (NEPA)(42 U.S.C. 4321, et seq) and APHIS' NEPA implementing procedures (7 Code of Federal Regulations (CFR) part 372) for the purpose of evaluating how the proposed action, if implemented, may affect the quality of the human environment. We are providing a 30-day public comment period for response to this EA. (Please send any comments to Carole Johnson, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, 4700 River Road, Unit 134, Riverdale, MD 20737.)

D. Affected Environment

The proposed treatment area consists of Santa Cruz County and northern Monterey County (see appendix B). LBAM has been found throughout much of this area. In fact, this area has approximately 87 percent of all LBAM captures in the State trapping program (CDFA, 2007a). As such, the entire area would be subject to the proposed pheromone treatments for mating disruption. This section

provides a general overview of the proposed treatment area, focusing on land use and host susceptibility.

Santa Cruz and northern Monterey Counties lie within three major land resource areas in California (USDA, 2006)—the Coastal Redwood Belt, the Central Coast Valley, and the Central Coast Range. The extreme northwest portion of Santa Cruz County lies within the Coastal Redwood Belt major land resource area. This area has a wide elevation range, extending from sea level along the Pacific coast to approximately 3,900 feet for some coastal range peaks. The average annual rainfall ranges from 23 to 98 inches, with an average annual temperature range of 49 to 59 °F.

Land use is dominated by forests followed by grassland and, to a lesser extent, farming and urban development. Vegetables and fruits are grown in areas that have favorable weather and soils. Several State parks exist within this major resource land area including Henry Cowell Redwoods, Fall Creek, Natural Bridges, Twin Lakes, New Brighton and Wilder Ranch. These parks contain a diverse population of plants, some of which are considered hosts for LBAM. For example, parks such as Henry Cowell Redwoods State Park contain Douglas fir, oak, and pine species, as well as the redwood and madrone, which are all occasional or common hosts for LBAM (appendix A). In another example, using the Wilder Ranch State Park plant inventory, the previously listed species as well as other plants such as California sagebrush, coyote brush, California bay and brome grasses are additional plants that have known susceptibility to LBAM (Wilder State Park 2002).

The above list of host species is not inclusive and does not include all known host plants for LBAM that may occur in the park, nor does it account for those plant species that have an unknown host susceptibility to LBAM. Several LBAM-susceptible native coastal plants and other susceptible host plants also exist in State parks that occupy the coastal areas. Urban development is minor as compared to the rest of the county with towns such as Boulder Creek, Felton, and Ben Loman being the major towns within the eastern edge of the Coastal Redwood area. Based on the presence of LBAM in other residential areas and the availability of hosts in the surrounding area, it is anticipated that susceptible host plants could be present in these towns.

The Central Coastal Valley region comprises the second area of the affected environment in Santa Cruz and northern Monterey Counties. Within the coastal valley area, the average precipitation ranges from

11 to 66 inches with most of the precipitation occurring as low or moderate frontal storms during winter.

Land use is divided primarily between cropland, grassland, and urban development, and, to a lesser extent, forests. Agriculture within the valley is principally truck crops, wine grapes, strawberries, and other fruits, cut flowers, small grains, hay, and pasture grown under irrigation. Several crops grown in this area, for example, strawberries and grapes, are common hosts for LBAM. Small grains are also grown under non-irrigated conditions (USDA, 2006). Urban development within the area includes Santa Cruz, Soquel, Rio Del Mar, and Watsonville, as well as other smaller towns. The coastal valley area extends as a small strip down to and including the town of Salinas, which is part of the agriculturally important Salinas Valley.

Santa Cruz, as well as the surrounding towns, currently have LBAM infestations that are expected to expand if left untreated, based on the number of susceptible hosts in urban and open areas. This area also has several State parks and beaches, such as Sunset State Beach, Manresa State Beach, and New Brighton State Beach, that occur along the coast. Several of the State beach parks have diverse plant life that includes multiple host plants for LBAM; for example, the coastal scrub and woodland habitats contain species such as coyote brush and Monterey pine, as well as other plants that are common host plants for LBAM.

The Central California Coast Range occupies the remainder of the potential area of pheromone treatment within southwestern Santa Cruz and northern Monterey County. This area has an average annual precipitation of 6 to 20 inches with most of the precipitation evenly distributed between the fall, winter, and spring, with low amounts in the summer (USDA, 2006).

Greater than half of the land use is in grassland followed by forest, cropland, and urban development. Agriculture in the area is limited to grains, with some fruit and vegetable production. Urban development consists of towns such as Prunedale and Castroville, as well as several other smaller towns in the area. Similar to areas identified in Santa Cruz and Monterey Counties, multiple native and agricultural species are present that are considered to be common hosts for LBAM. Natural areas, such as Royal Oaks State Park and the Salinas River National Refuge, include plants that are known hosts for LBAM.

Monterey Bay National Marine Sanctuary (MBNMS) extends along both Santa Cruz and Monterey Counties. The sanctuary is a federally protected marine area offshore of California's central coast. It

stretches from Marin to Cambria, and encompasses a shoreline length of 276 miles and 5,322 square miles of ocean. It supports a diverse marine ecosystem and is home to numerous mammals, seabirds, fishes, invertebrates, and plants.

II. Alternatives

This EA analyzes the potential environmental consequences of the proposed action to eradicate populations of LBAM from Santa Cruz and northern Monterey Counties, California, where LBAM have been detected. Two alternatives are being considered: (1) no action by APHIS to eliminate LBAM, and (2) treatment of LBAM using applications of a pheromone for mating disruption.

A. No Action

The no action alternative consists of maintaining the current Federal order without further action by APHIS. Private landowners would manage LBAM infestations, as appropriate.

Pursuant to the Federal order, the following regulated articles would not be moved interstate from a quarantine area except in accordance with this order:

- Nursery stock;
- Cut flowers, garlands, wreaths, or greenery of any plants;
- Trees and bushes, including cut Christmas trees;
- Greenwaste;
- Fruits and vegetables;
- Hay, straw, fodder, and plant litter;
- Bulk herbs and spices;
- Any other products, articles, or means of conveyance of any character whatsoever, when it is determined by an inspector that they present a hazard of spread of LBAM.

B. Treatment Alternative

The treatment alternative consists of maintaining the Federal quarantine order to prevent the artificial spread of LBAM, as well as using an insect pheromone to treat areas within Santa Cruz and northern Monterey Counties where LBAM has been detected.

Insect sex pheromones are compounds that are naturally produced by members of one sex for the purpose of attracting the opposite sex of the same species. Distribution of pheromone throughout an area

makes it difficult for the male to locate the female, thus disrupting mating for the species. For several lepidopteran pest species, including LBAM, the pheromone has been isolated and synthetically reproduced in order to be used to attract moths and, therefore, disrupt reproduction. There are two formulations of pheromone available to treat LBAM—a general tortricid pheromone that is attractive to species of the family Tortricidae (leafrollers), of which LBAM is a member, and an LBAM-specific pheromone. The LBAM-specific pheromone will be used when available.

Pheromone can be applied via a dispenser suspended from the ground, or applied by ground or aerial application equipment in microencapsulated capsules or flakes. When used at efficacious levels, the pheromone reduces the ability of male LBAM to locate and mate with females.

1. Dispensers

The dispensers are used at a rate of 250 dispensers per acre and are effective for 90 days before they need to be replaced.

2. Micro-encapsulated

The microencapsulated pheromone is effective for 30 days. Therefore, several applications may be needed per year. Applications of the LBAM-specific pheromone would be at the rate of 15 grams of active ingredient per acre (gai/A) and 20 gai/A for the general tortricid pheromone.

Due to the size of the proposed treatment area, aerial application of the microencapsulated pheromone will be the predominant treatment method. Aerial pheromone applications are planned to be conducted overnight, thus minimizing exposure of people. As infested areas are reduced in size over time, the use of dispensers may become more practical and, therefore, may increase in use. The initial treatment area is anticipated to consist of three blocks totalling approximately 60,000 acres located in the Soquel, Prunedale and north Salinas areas (see appendix B). Over time, however, the entire infested area within the Santa Cruz–northern Monterey population center will receive treatment. Any one area within this population center is likely to receive at least two and probably several treatments until it is determined that LBAM has been eradicated from the site. Complete eradication within the Santa Cruz and northern Monterey area is expected to take several years.

III. Environmental Impacts

A. No Action

Under the no action alternative, the current Federal order would remain in place without the application of pheromone. The host list for LBAM contains numerous species (trees, shrubs, and crops) that are common throughout the treatment area (see appendix A). Without treatment, LBAM would be allowed to flourish in the existing area and, consequently, continue to spread into surrounding areas. LBAM has the potential to severely damage residential landscapes, orchards, and agricultural crops.

Private individuals may utilize insecticides to control LBAM. However, without a coordinated treatment plan, reinfestation from adjacent untreated, infested sites will occur and would require additional applications, thus increasing pesticide loading to the environment. Alternative pesticides may have higher use rates and increased risks to human health and the environment. While several pesticides can be used against LBAM larvae, the only pesticide currently known to be efficacious against both eggs and larvae of LBAM is chlorpyrifos.

In addition to environmental impacts, LBAM could cause an estimated \$160 to \$640 million annually in crop damage and control costs if it spreads to agricultural production areas in the 11 affected counties (CDFA, 2007a). These estimated values were derived from the agricultural impacts in Australia and New Zealand from LBAM. If LBAM were to spread throughout the entire State of California damage and costs could reach up to \$2.4 billion annually. The presence of LBAM in the quarantine counties has caused restrictions on domestic and foreign trade. In 2003, California shipped over \$7.2 billion in food and agricultural commodities around the world (CASS, 2004). The loss of revenue from these restrictions is currently unknown; however this loss could be significant if LBAM becomes established throughout the State of California.

B. Treatment Alternative

As mentioned previously, there are two types of synthetic pheromones available to treat LBAM. The leafroller pheromone contains a compound that female leafrollers emit naturally to attract male moths. The LBAM-specific compound contains both the general female leafroller chemical as well as a chemical produced solely by the LBAM female. The LBAM-specific pheromone consists of, (E)-11-tetradecen-1-yl acetate and (E,E)-9,11-tetradecadien-1-yl acetate.

Both compounds have been identified in extracts of female LBAM and are active as a coalitive pair when combined (Bellas et al., 1983). The pheromone can be applied in individual dispensers, or, for larger areas, ground or aerial equipment can be used to broadcast spray the material.

The dispensers utilize the LBAM-specific pheromone that is contained within a sealed polyethylene tube containing 163.25 milligrams (mg) of (E)-11-tetradecen-1-yl acetate and 6.74 mg of (E,E)-9,11-tetradecadien-1-yl acetate. A wire is fused inside the plastic so that the dispenser can be twisted around a branch. The pheromone is released into the surrounding area and disrupts the ability of male LBAM to locate females. This treatment method has been shown to be an effective means of LBAM control in citrus, grapes, apple, and apricot orchards when adequate numbers of dispensers are used (Mo et al., 2006).

Over larger areas, pheromone can be applied in a biodegradable 80 to 150 micrometers (μm) microencapsulated polymer which has been shown to be an effective method of application when applied appropriately (Wilkins, 1990; Knight and Larsen, 2004; Mihou et al., 2007). The microencapsulated pheromone can be applied either by ground or aerial equipment and can consist of either the leafroller pheromone (at a rate of 20 gai/A) or the LBAM-specific pheromone (at a rate of 15 gai/A).

1. Toxicity

Based on available toxicity data, both pheromones have low acute oral and dermal toxicity in rats with median lethal dose (LD_{50} ; i.e. the dose required to kill 50 percent of a test population) values of greater than 5,000 milligram per kilogram (mg/kg) and 2,000 mg/kg, respectively. Acute inhalation toxicity is also low based on the acute inhalation median lethal concentration (LC_{50} ; i.e. the concentration required to kill 50 percent of a population) value of greater than 5.25 (grams per liter) g/L. These values are consistent with the toxicity profile for other lepidopteran pheromones that have been tested (OECD, 2002; Weatherston and Stewart, 2002). Available data suggests that lepidopteran pheromones have very low chronic toxicity to mammals (OECD, 2002; EPA, 1996). The pheromone is considered a slight to moderate dermal irritant and is not considered to be carcinogenic or mutagenic (Pacific Biocontrol Corporation, 2007).

Data for structurally similar pheromones indicate there is very low acute toxicity to birds with LD_{50} values greater than 2,000 mg/kg (Weatherston and Stewart, 2002). Toxicity to aquatic organisms is unknown for these two pheromones specifically; however, data for other pheromones suggest that fish LC_{50} values greater than 100 parts

per million (ppm), and aquatic invertebrate toxicity values range in the upper parts per billion (ppb) to low ppm range (Weatherston and Stewart, 2002; PMRA, 1994; Inscoc and Ridgway, 1992). Toxicity values for aquatic invertebrates may be misleading. Since the pheromone is hydrophobic, large amounts of pheromone must be added to the test chamber in order to obtain detectable amounts of pheromone in the water or else a solvent must be used. In the proposed application no solvent will be used and application rates are low at 15 to 20 grams a.i./acre. In addition, the pheromone is considered insoluble and it would not be possible for a body of water to achieve levels of dissolved pheromone that could approach toxic levels for aquatic invertebrates.

In summary, there are no reported adverse effects to humans, domestic or other nontarget animals, or the environment from the use of these pheromones.

2. Exposure and Risk

Lepidopteran pheromones are sensitive to ultraviolet radiation and oxidation where they breakdown rapidly in terrestrial and aquatic environments. The rapid breakdown and volatilization of lepidopteran pheromones and their mammalian toxicological profile have resulted in the Environmental Protection Agency (EPA) waiving the requirement of a food tolerance when applications do not exceed 150 grams of active ingredient per acre per year (g active ingredient/ac/year) (EPA, 2007). In addition to rapid degradation, lepidopteran pheromones have very low solubility or are insoluble in water suggesting low aquatic residues (OECD, 2002). This specific pheromone is reported to be insoluble in water (Pacific Biocontrol Corporation, 2007).

Exposure to humans, domestic and other nontarget animals, and the environment is expected to be minimal. In the case of the dispenser application, the pheromone is inside a plastic tube that is suspended in a tree; therefore, no human-related exposure from residues or drinking water is expected. The same would also be true for terrestrial nontarget organisms where exposure would be expected to be minimal. Exposure to aquatic organisms would not be expected when dispensers are used because label language prohibits discarding dispensers in surface water.

Pheromone that would be applied as a microencapsulated material in open and residential areas would not pose a risk to human health due to the known mammalian toxicity profile for lepidopteran pheromones and their environmental fate. Based on the known toxicology data for the pheromone, as well as similar types of compounds, acute and chronic effects do not occur at the highest concentrations tested; none

of the pheromones, to date, have shown any potential mutagenic or carcinogenic activity (Touhey, 1990; EPA, 1996; OECD, 2002). In addition to the lack of known toxicological effects, the exposure potential for humans is very low. No dietary exposure from food is expected due to the volatility of the pheromone. Incidental exposure through drinking water sources or swimming pools is expected to be minimal since the pheromone is insoluble in water and would remain at the surface volatilizing into the atmosphere. Both the low toxicity and lack of significant exposure result in minimal risk to human health from pheromone applications.

The only nontarget species that may be impacted by the use of pheromones could be native (or exotic) leafrollers that may be present and that could have their mating disrupted by the use of leafroller pheromone. Any impact to leafrollers would be minimal and temporary as populations would quickly recover due to immigration of leafrollers from adjacent, untreated areas. The use of LBAM-specific pheromone would only affect LBAM and perhaps a few other leafrollers. No other nontarget species are expected to be impacted. LBAM-specific pheromone is planned to be used in the initial application at Santa Cruz, and will be the preferred pheromone for all treatments based on available supplies.

The microencapsulated pheromone will also pose minimal risk to terrestrial wildlife and aquatic organisms. This is based on the known toxicity data for these types of pheromones, as well as the low exposure that would occur from ground or aerial pheromone applications. In addition, the pheromone will not be applied directly to open water per label instructions. As a means to quantify these conclusions, a screening level ecological risk assessment was prepared to address potential risk to nontarget fish and wildlife (see appendix C).

C. Cumulative Effects

Cumulative effects from potential pheromone use over several years is not expected to occur based on the known toxicity data, specificity of the pheromones to LBAM and leafrollers, and minimal risk to human health and the environment. Cumulative impacts to nontarget butterflies and moths, except for tortricids, from the use of pheromones are not anticipated because the pheromones are selective for LBAM and leafrollers. The cumulative impacts to leafrollers will be minimized because LBAM-specific pheromone will be used when available.

Treatments of isolated populations of LBAM have begun in a number of sites including Napa, Oakley, Danville, Dublin, Sherman Oaks, San Jose and Vallejo. Approximately 35 to 40 isolated populations have been identified; there is potential for additional sites to be identified in the future. Treatments in the isolated areas have primarily consisted of application of pheromone dispensers that are removed after 90 days. These areas are small in nature and occur outside of any aerially treated areas.

Recently, the Marina–Seaside–Monterey Peninsula area was treated with aerial application of microencapsulated pheromone. A second aerial application is anticipated in the near future. This area is adjacent to but not overlapping the proposed treatment area. Due to the nature of the pheromone, the minimal environmental effects, and the fact that the treatment areas do not overlap, it is unlikely that there will be any cumulative impacts with the use of this pheromone in isolated treatment areas of the Marina–Seaside–Monterey Peninsula and the Santa Cruz and Monterey County areas.

Future treatments for LBAM will be evaluated under subsequent EAs. The environmental impacts from these treatments will be evaluated in combination with treatments already underway.

D. Threatened and Endangered Species

Section 7(a)(2) of the Endangered Species Act (ESA) and its implementing regulations require all Federal agencies to ensure their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of critical habitat. CDFA and APHIS are working with the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) to insure that treatment activities considered in this EA do not affect listed species or their designated or proposed critical habitats. No treatments will occur in the treatment area until CDFA and APHIS have completed a determination of effects on listed species and their habitats and, if necessary, Section 7 consultation with FWS and/or NMFS has been concluded.

APHIS has designated CDFA as its non-Federal representative for the purpose of conducting informal consultation with FWS and NMFS on APHIS activities associated with the LBAM eradication program in California and will work with CDFA to develop all necessary consultation documents. Legally, APHIS retains ultimate responsibility for compliance with Section 7 of the ESA.

CDFA and APHIS will continue to work in close cooperation with NMFS and FWS during implementation any LBAM eradication efforts to insure that potential impacts to listed species and their designated critical habitats are avoided or minimized to the extent possible, and are consistent with the statutory and regulatory requirements of Section 7 of ESA.

E. Other Considerations

Executive Order (EO) 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations,” focuses Federal attention on the environmental and human health conditions of minority and low-income communities and promotes community access to public information and public participation in matters relating to human health or the environment. This EO requires Federal agencies to conduct their programs, policies, and activities that substantially affect human health or the environment in a manner so as not to exclude persons and populations from participation in or benefiting from such programs. It also enforces existing statutes to prevent minority and low-income communities from being subjected to disproportionately high or adverse human health or environmental effects. APHIS has determined that the environmental and human health effects from the proposed applications for treatment of LBAM in California are minimal and are not expected to have disproportionate adverse effects to any minority or low-income populations.

EO 13045, “Protection of Children from Environmental Health Risks and Safety Risks,” acknowledges that children, as compared to adults, may suffer disproportionately from environmental health and safety risks because of developmental stage, greater metabolic activity levels, and behavior patterns. This EO (to the extent permitted by law and consistent with the agency’s mission) requires each Federal agency to identify, assess, and address environmental health risks and safety risks that may disproportionately affect children. Aerial pheromone applications are planned to be conducted overnight, thus minimizing exposure of people, and especially children; however the low toxicity of the pheromone minimizes any potential risk to children.

The Monterey Bay National Marine Sanctuary (sanctuary) is adjacent to the proposed treatment area. This is a federally protected marine area offshore of California's central coast. It stretches from Marin County to Cambria; it encompasses a shoreline length of 276 miles and 5,322 square miles of ocean. This area supports a diverse marine ecosystem and is home to numerous mammals, seabirds, fish, invertebrates, and plants in a remarkably productive coastal

environment. The sanctuary was established for the purposes of resource protection, research, education, and public use. Any discharge or deposit of foreign materials in the sanctuary that would be injurious requires a permit from the sanctuary.

Consultations with the marine sanctuary staff, prior to the recent treatment in the Marina–Seaside–Monterey Peninsula, identified areas of concern to the sanctuary. These concerns centered around the potential for aerially applied material to drift from the intended target and the risk that would be posed to marine resources, should that occur. APHIS and CDFA provided the sanctuary with additional information regarding the procedures and protocols of the aerial application of pheromone in the area, including transect maps. APHIS also provided additional risk assessment documentation (appendix C) that demonstrated that, even if some pheromone material were to enter water, there is little likelihood that it could result in any negative impacts on marine life. Testing indicates that toxicity thresholds are many times higher than the environmental concentrations that would be expected even if the pheromone were directly applied to the water. In addition, the pheromone is not soluble in water and quickly volatilizes or breaks down due to ultraviolet light and, therefore, would not affect aquatic organisms.

APHIS continues to consult with the sanctuary staff to ensure that their concerns are addressed with regard to the proposed treatment in Santa Cruz and northern Monterey Counties.

CDFA has consulted with the Central Coast Regional Water Quality Control Board to ensure that water quality standards are not jeopardized by the proposed program. The Water Quality Control Board indicated that as long as the applications are done as they were in the recent Marina–Seaside–Monterey Peninsula application (that is, material is applied in accordance with the restrictions of the Section 18 pesticide label and direct applications to open water are avoided), they have no objections to the proposal and will not require a permit.

IV. Listing of Agencies and Persons Consulted

U.S. Fish and Wildlife Service
Ventura Fish & Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003

National Marine Fisheries Service
Southwest Regional Office
501 West Ocean Blvd, Suite 4200
Long Beach, CA 90802-4213

U.S. Department of Agriculture
Animal Plant Health Inspection Service
Plant Protection and Quarantine
Emergency and Domestic Programs
4700 River Rd. Unit 134
Riverdale, MD 20737

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Policy and Program Development
Environmental Services
4700 River Road, Unit 149
Riverdale, MD 20737

California Department of Food and Agriculture
Plant Health and Pest Prevention Services
1220 N Street
Sacramento, CA 95814-5607

California Environmental Protection Agency
Central Coast Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401

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Appendix A. Light Brown Apple Moth Host List

Genus Species	Common Name	Genus Match Host Prevalence
<i>Abelia</i> spp.	(abelia)	Occasional
<i>Abies</i>	fir	Common
<i>Abies xshastensis</i>	Shasta red fir	Common
<i>Abies amabilis</i>	Pacific silver fir	Common
<i>Abies bracteata</i>	bristlecone fir	Common
<i>Abies concolor</i>	white fir	Common
<i>Abies concolor</i>	white fir	Common
<i>Abies grandis</i>	grand fir	Common
<i>Abies lasiocarpa</i>	subalpine fir	Common
<i>Abies lowiana</i>		Common
<i>Abies magnifica</i>	California red fir	Common
<i>Abies procera</i>	noble fir	Common
<i>Abies</i> spp.	(fir)	Common
<i>Acacia</i>	acacia	Common
<i>Acacia baileyana</i>	cootamundra wattle	Common
<i>Acacia cyclops</i>	cyclops acacia	Common
<i>Acacia dealbata</i>	silver wattle	Common
<i>Acacia decurrens</i>	green wattle	Common
<i>Acacia elata</i>	cedar wattle	Common
<i>Acacia farnesiana</i>	sweet acacia	Common
<i>Acacia greggii</i>	catclaw acacia	Common
<i>Acacia longifolia</i>		Common
<i>Acacia mearnsii</i>	black wattle	Common
<i>Acacia melanoxylon</i>	blackwood	Common
<i>Acacia paradoxa</i>	paradox acacia	Common
<i>Acacia podalyriifolia</i>	pearl wattle	Common
<i>Acacia pycnantha</i>	golden wattle	Common
<i>Acacia redolens</i>	bank catclaw	Common
<i>Acacia retinodes</i>	water wattle	Common
<i>Acacia saligna</i>	orange wattle	Common
<i>Acacia</i> spp.	(acacias)	Common
<i>Acacia verticillata</i>	prickly Moses	Common
<i>Acer</i>	maple	
<i>Acer campestre</i>	hedge maple	
<i>Acer circinatum</i>	vine maple	
<i>Acer glabrum</i>	Douglas maple	
<i>Acer glabrum</i>	Greene's maple	
<i>Acer glabrum</i>	Rocky Mountain maple	
<i>Acer glabrum</i>	Torrey maple	
<i>Acer macrophyllum</i>	bigleaf maple	
<i>Acer negundo</i>	boxelder	
<i>Acer negundo</i>	California boxelder	
<i>Acer saccharinum</i>	silver maple	
<i>Acer</i> spp.	(maple)	
<i>Achillea</i>	yarrow	Common

<i>Achillea filipendulina</i>	fernleaf yarrow	Common
<i>Achillea millefolium</i>	California yarrow	Common
<i>Achillea millefolium</i>	common yarrow	Common
<i>Achillea millefolium</i>	giant yarrow	Common
<i>Achillea millefolium</i>	Pacific yarrow	Common
<i>Achillea millefolium</i>	western yarrow	Common
<i>Achillea</i> spp.	(yarrow)	Common
<i>Acmena</i> spp.	(lilly-pilly tree)	Occasional
<i>Actinidia</i> spp.	(Chinese gooseberry, kiwi, kiwifruit)	Primary
<i>Adiantum</i>	maidenhair fern	Occasional
<i>Adiantum xtracyi</i>		Occasional
<i>Adiantum aleuticum</i>	Aleutian maidenhair	Occasional
<i>Adiantum capillus-veneris</i>	common maidenhair	Occasional
<i>Adiantum jordanii</i>	California maidenhair	Occasional
<i>Adiantum</i> spp.	(maidenhair ferns)	Occasional
<i>Aesculus</i>	buckeye	Occasional
<i>Aesculus californica</i>	California buckeye	Occasional
<i>Aesculus</i> spp.	(horse chestnut, buckeye)	Occasional
<i>Alnus</i>	alder	
<i>Alnus cordata</i>	Italian alder	
<i>Alnus incana</i>	gray alder	
<i>Alnus incana</i>	thinleaf alder	
<i>Alnus rhombifolia</i>	White Alder	
<i>Alnus rhombifolia</i>	White Alder	
<i>Alnus rubra</i>	red alder	
<i>Alnus</i> spp.	(alder)	
<i>Alnus viridis</i>	green alder	
<i>Alnus viridis</i>	Siberian alder	
<i>Alnus viridis</i>	Sitka alder	
<i>Amaranthus</i>	pigweed	Occasional
<i>Amaranthus albus</i>	prostrate pigweed	Occasional
<i>Amaranthus arenicola</i>	sandhill amaranth	Occasional
<i>Amaranthus blitoides</i>	mat amaranth	Occasional
<i>Amaranthus blitum</i>		Occasional
<i>Amaranthus blitum</i>	purple amaranth	Occasional
<i>Amaranthus californicus</i>	California amaranth	Occasional
<i>Amaranthus caudatus</i>	love-lies-bleeding	Occasional
<i>Amaranthus cruentus</i>	red amaranth	Occasional
<i>Amaranthus deflexus</i>	largefruit amaranth	Occasional
<i>Amaranthus fimbriatus</i>	fringed amaranth	Occasional
<i>Amaranthus hybridus</i>	slim amaranth	Occasional
<i>Amaranthus hypochondriacus</i>	Prince-of-Wales feather	Occasional
<i>Amaranthus palmeri</i>	carelessweed	Occasional
<i>Amaranthus powellii</i>		Occasional
<i>Amaranthus powellii</i>	Powell's amaranth	Occasional
<i>Amaranthus retroflexus</i>	redroot amaranth	Occasional
<i>Amaranthus spinosus</i>	spiny amaranth	Occasional
<i>Amaranthus</i> spp.		Occasional
<i>Amaranthus torreyi</i>	Torrey's amaranthus	Occasional
<i>Amaranthus tuberculatus</i>	roughfruit amaranth	Occasional
<i>Amaranthus watsonii</i>	Watson's amaranth	Occasional

<i>Antirrhinum</i>	snapdragon	Occasional
<i>Antirrhinum majus</i>	garden snapdragon	Occasional
<i>Antirrhinum</i> spp.	(snapdragons)	Occasional
<i>Apium</i>	celery	Occasional
<i>Apium graveolens</i>	wild celery	Occasional
<i>Apium nodiflorum</i>	European marshwort	Occasional
<i>Apium</i> spp.	(celery)	Occasional
<i>Aquilegia</i>	columbine	Common
<i>Aquilegia eximia</i>	Van Houtte's columbine	Common
<i>Aquilegia formosa</i>	western columbine	Common
<i>Aquilegia pubescens</i>	Sierra columbine	Common
<i>Aquilegia shockleyi</i>		Common
<i>Aquilegia</i> spp.	(columbines)	Common
<i>Arbutus</i>	madrone	Common
<i>Arbutus menziesii</i>	Pacific madrone	Common
<i>Arbutus</i> spp.	Strawberry Tree	Common
<i>Arctostaphylos</i>	manzanita	
<i>Arctostaphylos xbenitoensis</i>		
<i>Arctostaphylos xcampbelliae</i>		
<i>Arctostaphylos xcinerea</i>	Waldo manzanita	
<i>Arctostaphylos xhelleri</i>		
<i>Arctostaphylos xjepsonii</i>		
<i>Arctostaphylos xlaxiflora</i>		
<i>Arctostaphylos xmedia</i>		
<i>Arctostaphylos xparvifolia</i>		
<i>Arctostaphylos xrepens</i>	PMC manzanita	
<i>Arctostaphylos andersonii</i>	Santa Cruz manzanita	
<i>Arctostaphylos auriculata</i>	Mount Diablo manzanita	
<i>Arctostaphylos bakeri</i>	Baker's manzanita	
<i>Arctostaphylos bakeri</i>	Baker's manzanita	
<i>Arctostaphylos bakeri</i>	The Cedars manzanita	
<i>Arctostaphylos canescens</i>	hoary manzanita	
<i>Arctostaphylos canescens</i>	Sonoma manzanita	
<i>Arctostaphylos catalinae</i>	Santa Catalina Island Manzanita	
<i>Arctostaphylos columbiana</i>	hairy manzanita	
<i>Arctostaphylos confertiflora</i>	Santa Rosa Island Manzanita	
<i>Arctostaphylos cruzensis</i>	La Cruz manzanita	
<i>Arctostaphylos densiflora</i>	Vine Hill manzanita	
<i>Arctostaphylos edmundsii</i>	Little Sur manzanita	
<i>Arctostaphylos gabrielensis</i>	San Gabriel manzanita	
<i>Arctostaphylos glandulosa</i>	Adams' manzanita	
<i>Arctostaphylos glandulosa</i>	Del Mar manzanita	
<i>Arctostaphylos glandulosa</i>	Eastwood's manzanita	
<i>Arctostaphylos glandulosa</i>	Zaca's manzanita	
<i>Arctostaphylos glauca</i>	bigberry manzanita	
<i>Arctostaphylos glutinosa</i>	Schreiber's manzanita	
<i>Arctostaphylos hispidula</i>	Gasquet manzanita	
<i>Arctostaphylos hookeri</i>	Franciscan manzanita	
<i>Arctostaphylos hookeri</i>	Hearst's manzanita	
<i>Arctostaphylos hookeri</i>	Hooker's manzanita	
<i>Arctostaphylos hookeri</i>	Mt. Tamalpais manzanita	

<i>Arctostaphylos hookeri</i>	Presidio manzanita
<i>Arctostaphylos hooveri</i>	Hoover's manzanita
<i>Arctostaphylos imbricata</i>	San Bruno Mountain Manzanita
<i>Arctostaphylos insularis</i>	island manzanita
<i>Arctostaphylos klamathensis</i>	Klamath manzanita
<i>Arctostaphylos luciana</i>	Santa Lucia manzanita
<i>Arctostaphylos malloryi</i>	Mallory's manzanita
<i>Arctostaphylos manzanita</i>	Contra Costa manzanita
<i>Arctostaphylos manzanita</i>	Konocti manzanita
<i>Arctostaphylos manzanita</i>	Roof's manzanita
<i>Arctostaphylos manzanita</i>	whiteleaf manzanita
<i>Arctostaphylos manzanita</i>	Wieslander's manzanita
<i>Arctostaphylos mendocinoensis</i>	pygmy manzanita
<i>Arctostaphylos mewukka</i>	Indian manzanita
<i>Arctostaphylos mewukka</i>	True's manzanita
<i>Arctostaphylos montaraensis</i>	Montara manzanita
<i>Arctostaphylos montereyensis</i>	Monterey manzanita
<i>Arctostaphylos morroensis</i>	Morro manzanita
<i>Arctostaphylos myrtifolia</i>	lone manzanita
<i>Arctostaphylos nevadensis</i>	pinemat manzanita
<i>Arctostaphylos nissenana</i>	Nissenan manzanita
<i>Arctostaphylos nortensis</i>	Del Norte manzanita
<i>Arctostaphylos nummularia</i>	glossyleaf manzanita
<i>Arctostaphylos obispoensis</i>	serpentine manzanita
<i>Arctostaphylos osoensis</i>	Oso manzanita
<i>Arctostaphylos otayensis</i>	Otay manzanita
<i>Arctostaphylos pacifica</i>	Pacific manzanita
<i>Arctostaphylos pajaroensis</i>	Pajaro manzanita
<i>Arctostaphylos pallida</i>	Alameda manzanita
<i>Arctostaphylos parryana</i>	Parry manzanita
<i>Arctostaphylos patula</i>	greenleaf manzanita
<i>Arctostaphylos pechoensis</i>	Pecho manzanita
<i>Arctostaphylos peninsularis</i>	Peninsular manzanita
<i>Arctostaphylos pilosula</i>	La Panza manzanita
<i>Arctostaphylos pringlei</i>	pinkbracted manzanita
<i>Arctostaphylos pringlei</i>	Pringle manzanita
<i>Arctostaphylos pumila</i>	sandmat manzanita
<i>Arctostaphylos pungens</i>	pointleaf manzanita
<i>Arctostaphylos purissima</i>	La Purissima manzanita
<i>Arctostaphylos rainbowensis</i>	Rainbow manzanita
<i>Arctostaphylos refugioensis</i>	Refugio manzanita
<i>Arctostaphylos regismontana</i>	Kings Mountain manzanita
<i>Arctostaphylos rudis</i>	shagbark manzanita
<i>Arctostaphylos silvicola</i>	Bonny Doon manzanita
<i>Arctostaphylos</i> spp.	Manzanita
<i>Arctostaphylos stanfordiana</i>	Raiche's manzanita
<i>Arctostaphylos stanfordiana</i>	Rincon manzanita
<i>Arctostaphylos stanfordiana</i>	Stanford's manzanita
<i>Arctostaphylos tomentosa</i>	brittleleaf manzanita
<i>Arctostaphylos tomentosa</i>	dacite manzanita
<i>Arctostaphylos tomentosa</i>	rosy manzanita

<i>Arctostaphylos tomentosa</i>	Santa Cruz Island Manzanita	
<i>Arctostaphylos tomentosa</i>	woollyleaf manzanita	
<i>Arctostaphylos uva-ursi</i>	kinnikinnick	
<i>Arctostaphylos virgata</i>	Bolinas manzanita	
<i>Arctostaphylos viridissima</i>	whitehair manzanita	
<i>Arctostaphylos viscida</i>	Mariposa manzanita	
<i>Arctostaphylos viscida</i>	sticky whiteleaf manzanita	
<i>Arctostaphylos wellsii</i>	Wells' manzanita	
<i>Arctotheca</i>	Capeweed	Common
<i>Arctotheca calendula</i>	Capeweed	Common
<i>Arctotheca</i> spp.	(capeweeds, cape dandelion)	Common
<i>Arctotis</i>	arctotis	Common
<i>Arctotis</i> spp.	(African daisy)	Common
<i>Arctotis stoechadifolia</i>	African daisy	Common
<i>Aronia melanocarpa</i>	Chokeberry	
<i>Artemisia</i>	sagebrush	Common
<i>Artemisia annua</i>	sweet sagewort	Common
<i>Artemisia arbuscula</i>	little sagebrush	Common
<i>Artemisia arctica</i>	boreal sagebrush	Common
<i>Artemisia biennis</i>	biennial wormwood	Common
<i>Artemisia bigelovii</i>	Bigelow sage	Common
<i>Artemisia californica</i>	coastal sagebrush	Common
<i>Artemisia campestris</i>	field sagewort	Common
<i>Artemisia campestris</i>	field sagewort	Common
<i>Artemisia campestris</i>	field sagewort	Common
<i>Artemisia cana</i>	silver sagebrush	Common
<i>Artemisia douglasiana</i>	Douglas' sagewort	Common
<i>Artemisia dracunculus</i>	tarragon	Common
<i>Artemisia lindleyana</i>	Columbia River wormwood	Common
<i>Artemisia ludoviciana</i>	white sagebrush	Common
<i>Artemisia ludoviciana</i>	white sagebrush	Common
<i>Artemisia michauxiana</i>	Michaux's wormwood	Common
<i>Artemisia nesiotica</i>	island sagebrush	Common
<i>Artemisia norvegica</i>		Common
<i>Artemisia nova</i>	black sagebrush	Common
<i>Artemisia palmeri</i>	San Diego sagewort	Common
<i>Artemisia pycnocephala</i>	beach wormwood	Common
<i>Artemisia rothrockii</i>	timberline sagebrush	Common
<i>Artemisia spinescens</i>		Common
<i>Artemisia</i> spp.		Common
<i>Artemisia suksdorfii</i>	coastal wormwood	Common
<i>Artemisia tridentata</i>	basin big sagebrush	Common
<i>Artemisia tridentata</i>	big sagebrush	Common
<i>Artemisia tridentata</i>	mountain big sagebrush	Common
<i>Artemisia tridentata</i>	Wyoming big sagebrush	Common
<i>Artemisia vulgaris</i>	common wormwood	Common
<i>Asparagus</i>	asparagus	Occasional
<i>Asparagus asparagoides</i>	African asparagus fern	Occasional
<i>Asparagus densiflorus</i>	Sprenger's asparagus fern	Occasional
<i>Asparagus officinalis</i>	garden asparagus	Occasional
<i>Asparagus setaceus</i>	common asparagus fern	Occasional

<i>Asparagus</i> spp.	(asparagus, asparagus fern, smilax asparagus)	Occasional
<i>Astartea</i> spp.		
<i>Aster intricatus</i>		Common
<i>Aster</i> spp.	(asters)	Common
<i>Athyrium</i>	ladyfern	
<i>Athyrium americanum</i>	alpine ladyfern	
<i>Athyrium distentifolium</i>		
<i>Athyrium filix-femina</i>	Lady Fern	
<i>Athyrium filix-femina</i>	common ladyfern	
<i>Athyrium filix-femina</i>	subarctic ladyfern	
<i>Aucuba</i> spp.	(aucuba, Himalaya laurel, Japanese laurel)	Occasional
<i>Azara microphylla</i>	Boxleaf Azara	
<i>Baccharis</i>	baccharis	Common
<i>Baccharis brachyphylla</i>	shortleaf baccharis	Common
<i>Baccharis douglasii</i>	saltmarsh baccharis	Common
<i>Baccharis emoryi</i>	Emory's baccharis	Common
<i>Baccharis glutinosa</i>		Common
<i>Baccharis malibuensis</i>	Malibu baccharis	Common
<i>Baccharis pilularis</i>	coyotebrush	Common
<i>Baccharis plummerae</i>	Plummer's baccharis	Common
<i>Baccharis plummerae</i>	smooth baccharis	Common
<i>Baccharis salicifolia</i>	mule's fat	Common
<i>Baccharis sarothroides</i>	desertbroom	Common
<i>Baccharis sergiloides</i>	desert baccharis	Common
<i>Baccharis</i> spp.	(coyote brush, desert broom)	Common
<i>Baccharis vanessae</i>	Encinitis false willow	Common
<i>Banksia</i> spp.	(candle flowers)	Common
<i>Begonia</i> spp.	(begonia)	Occasional
<i>Berberis</i>	barberry	Occasional
<i>Berberis aquifolium</i>		Occasional
<i>Berberis darwinii</i>	Darwin's berberis	Occasional
<i>Berberis fremontii</i>		Occasional
<i>Berberis haematocarpa</i>		Occasional
<i>Berberis nervosa</i>		Occasional
<i>Berberis nevini</i>		Occasional
<i>Berberis pinnata</i>		Occasional
<i>Berberis pumila</i>		Occasional
<i>Berberis repens</i>		Occasional
<i>Berberis</i> spp.	(barberry)	Occasional
<i>Beta</i>	beet	Occasional
<i>Beta</i> spp.	(beet)	Occasional
<i>Beta vulgaris</i>	common beet	Occasional
<i>Betula</i>	birch	Occasional
<i>Betula glandulosa</i>	resin birch	Occasional
<i>Betula jacquemontii</i>	Birch	Occasional
<i>Betula nana</i>	dwarf birch	Occasional
<i>Betula occidentalis</i>	water birch	Occasional
<i>Betula pumila</i>	bog birch	Occasional
<i>Betula pumila</i>	bog birch	Occasional
<i>Betula</i> spp.	(birch)	Occasional
<i>Blandfordia</i> spp.	(Christmas bells)	

<i>Boronia</i> spp.	(boronias)	Common
<i>Brassica</i>	mustard	Occasional
<i>Brassica fruticulosa</i>	Mediterranean cabbage	Occasional
<i>Brassica juncea</i>	India mustard	Occasional
<i>Brassica napus</i>	rape	Occasional
<i>Brassica nigra</i>	black mustard	Occasional
<i>Brassica oleracea</i>	cabbage	Occasional
<i>Brassica rapa</i>	field mustard	Occasional
<i>Brassica</i> spp.	(broccoli, cauliflower, cabbage, cress, kale, mustard, etc.)	Occasional
<i>Brassica tournefortii</i>	Asian mustard	Occasional
<i>Breynia</i> spp.	(snow bush)	Occasional
<i>Bromus</i>	brome	Occasional
<i>Bromus alopecuroides</i>	weedy brome	Occasional
<i>Bromus anomalus</i>		Occasional
<i>Bromus arenarius</i>	Australian brome	Occasional
<i>Bromus arizonicus</i>	Arizona brome	Occasional
<i>Bromus arvensis</i>	field brome	Occasional
<i>Bromus berteroi</i>	Chilean chess	Occasional
<i>Bromus briziformis</i>	rattlesnake brome	Occasional
<i>Bromus carinatus</i>	California brome	Occasional
<i>Bromus catharticus</i>	rescuegrass	Occasional
<i>Bromus ciliatus</i>	fringed brome	Occasional
<i>Bromus ciliatus</i>	fringed brome	Occasional
<i>Bromus diandrus</i>	ripgut brome	Occasional
<i>Bromus erectus</i>	erect brome	Occasional
<i>Bromus grandis</i>	tall brome	Occasional
<i>Bromus hordeaceus</i>	soft brome	Occasional
<i>Bromus inermis</i>	smooth brome	Occasional
<i>Bromus laevipes</i>	Chinook brome	Occasional
<i>Bromus marginatus</i>	mountain brome	Occasional
<i>Bromus maritimus</i>	seaside brome	Occasional
<i>Bromus matritensis</i>	compact brome	Occasional
<i>Bromus orcuttianus</i>	Orcutt's brome	Occasional
<i>Bromus pacificus</i>		Occasional
<i>Bromus polyanthus</i>	Great Basin brome	Occasional
<i>Bromus porteri</i>	Porter brome	Occasional
<i>Bromus pseudolaevipes</i>	coast range brome	Occasional
<i>Bromus racemosus</i>	bald brome	Occasional
<i>Bromus richardsonii</i>		Occasional
<i>Bromus rubens</i>	red brome	Occasional
<i>Bromus scoparius</i>	broom brome	Occasional
<i>Bromus secalinus</i>		Occasional
<i>Bromus secalinus</i>	rye brome	Occasional
<i>Bromus sitchensis</i>	Alaska brome	Occasional
<i>Bromus</i> spp.	(brome, brome grass, chess, foxtail, rescuegrass)	Occasional
<i>Bromus stamineus</i>	roadside brome	Occasional
<i>Bromus sterilis</i>	poverty brome	Occasional
<i>Bromus subvelutinus</i>	hoary brome	Occasional
<i>Bromus suksdorfii</i>	Suksdorf's brome	Occasional
<i>Bromus tectorum</i>	cheatgrass	Occasional

<i>Bromus vulgaris</i>	Columbia brome	Occasional
<i>Buddleia</i> spp.	(butterfly bush)	
<i>Buddleja</i>	butterflybush	Common
<i>Buddleja davidii</i>	orange eye butterflybush	Common
<i>Buddleja saligna</i>	squarestem butterflybush	Common
<i>Buddleja utahensis</i>	Utah butterflybush	Common
<i>Bursaria</i> spp.	(black thorns, prickly box)	
<i>Calendula</i>	marigold	Common
<i>Calendula arvensis</i>	field marigold	Common
<i>Calendula officinalis</i>	pot marigold	Common
<i>Calendula</i> spp.	(calendula, marigold)	Common
<i>Callistemon</i> spp.		Occasional
<i>Camellia</i> spp.	(camellia)	Occasional
<i>Campsis</i>	campsis	Occasional
<i>Campsis radicans</i>	trumpet creeper	Occasional
<i>Campsis</i> spp.	(trumpet creeper, trumpet vine)	Occasional
<i>Capsella</i>	capsella	Occasional
<i>Capsella bursa-pastoris</i>	shepherd's purse	Occasional
<i>Capsella</i> spp.	(shepard's purse)	Occasional
<i>Capsicum</i>	pepper	Occasional
<i>Capsicum annuum</i>	cayenne pepper	Occasional
<i>Capsicum</i> spp.	Pepper	Occasional
<i>Carduus</i>	plumeless thistle	Common
<i>Carduus acanthoides</i>	spiny plumeless thistle	Common
<i>Carduus nutans</i>	nodding plumeless thistle	Common
<i>Carduus pycnocephalus</i>	Italian plumeless thistle	Common
<i>Carduus</i> spp.		Common
<i>Carduus tenuiflorus</i>	winged plumeless thistle	Common
<i>Carmichaelia</i> spp.		Very Common
<i>Carpobrotus</i>	carpobrotus	
<i>Carpobrotus chilensis</i>	sea fig	
<i>Carpobrotus edulis</i>	hottentot fig	
<i>Carpobrotus</i> spp.		
<i>Cassia</i> spp.	(golden shower, pink shower, rainbow shower, gold medallion tree)	Very Common
<i>Ceanothus</i>	ceanothus	Occasional
<i>Ceanothus xarcuatus</i>		Occasional
<i>Ceanothus xbakeri</i>		Occasional
<i>Ceanothus xflexilis</i>	flexible ceanothus	Occasional
<i>Ceanothus xlobbianus</i>		Occasional
<i>Ceanothus xlorenzenii</i>		Occasional
<i>Ceanothus xmendocinensis</i>	Mendocino ceanothus	Occasional
<i>Ceanothus xotayensis</i>		Occasional
<i>Ceanothus xrugosus</i>		Occasional
<i>Ceanothus xserrulatus</i>	Cascade Lake ceanothus	Occasional
<i>Ceanothus xvanrensselaeri</i>		Occasional
<i>Ceanothus xveitchianus</i>		Occasional
<i>Ceanothus arboreus</i>	fettleaf ceanothus	Occasional
<i>Ceanothus confusus</i>	Rincon Ridge ceanothus	Occasional
<i>Ceanothus connivens</i>	trailing buckbrush	Occasional
<i>Ceanothus cordulatus</i>	whitethorn ceanothus	Occasional

<i>Ceanothus crassifolius</i>	hoaryleaf ceanothus	Occasional
<i>Ceanothus cuneatus</i>	buckbrush	Occasional
<i>Ceanothus cuneatus</i>	Monterey ceanothus	Occasional
<i>Ceanothus cuneatus</i>	sedgeleaf buckbrush	Occasional
<i>Ceanothus cyaneus</i>	San Diego buckbrush	Occasional
<i>Ceanothus dentatus</i>	sandscrub ceanothus	Occasional
<i>Ceanothus divergens</i>	Calistoga ceanothus	Occasional
<i>Ceanothus diversifolius</i>	pinemat	Occasional
<i>Ceanothus ferrisiae</i>	Coyote ceanothus	Occasional
<i>Ceanothus foliosus</i>	Vine Hill ceanothus	Occasional
<i>Ceanothus foliosus</i>	wavyleaf buckbrush	Occasional
<i>Ceanothus foliosus</i>	wavyleaf ceanothus	Occasional
<i>Ceanothus fresnensis</i>	Fresno mat	Occasional
<i>Ceanothus gloriosus</i>	Mt. Vision ceanothus	Occasional
<i>Ceanothus gloriosus</i>	Point Reyes ceanothus	Occasional
<i>Ceanothus greggii</i>	desert ceanothus	Occasional
<i>Ceanothus greggii</i>	Mojave ceanothus	Occasional
<i>Ceanothus griseus</i>	Carmel ceanothus	Occasional
<i>Ceanothus hearstiorum</i>	Hearst Ranch buckbrush	Occasional
<i>Ceanothus impressus</i>	Santa Barbara ceanothus	Occasional
<i>Ceanothus incanus</i>	coast whitethorn	Occasional
<i>Ceanothus integerrimus</i>	deerbrush	Occasional
<i>Ceanothus jepsonii</i>	Jepson ceanothus	Occasional
<i>Ceanothus lemmonii</i>	Lemmon's ceanothus	Occasional
<i>Ceanothus leucodermis</i>	chaparral whitethorn	Occasional
<i>Ceanothus maritimus</i>	maritime ceanothus	Occasional
<i>Ceanothus masonii</i>	Mason's ceanothus	Occasional
<i>Ceanothus megacarpus</i>	bigpod ceanothus	Occasional
<i>Ceanothus megacarpus</i>	island ceanothus	Occasional
<i>Ceanothus oliganthus</i>	hairy ceanothus	Occasional
<i>Ceanothus ophiochilus</i>	Vail Lake ceanothus	Occasional
<i>Ceanothus palmeri</i>	Palmer ceanothus	Occasional
<i>Ceanothus papillosus</i>	wartleaf ceanothus	Occasional
<i>Ceanothus parryi</i>	Parry ceanothus	Occasional
<i>Ceanothus parvifolius</i>	littleleaf ceanothus	Occasional
<i>Ceanothus pinetorum</i>	Coville ceanothus	Occasional
<i>Ceanothus prostratus</i>	prostrate ceanothus	Occasional
<i>Ceanothus pumilus</i>	dwarf ceanothus	Occasional
<i>Ceanothus purpureus</i>	hollyleaf ceanothus	Occasional
<i>Ceanothus roderickii</i>	Pine Hill buckbrush	Occasional
<i>Ceanothus sanguineus</i>	redstem ceanothus	Occasional
<i>Ceanothus sonomensis</i>	Sonoma ceanothus	Occasional
<i>Ceanothus soledadensis</i>	jimbrush	Occasional
<i>Ceanothus spinosus</i>	redheart	Occasional
<i>Ceanothus</i> spp.	(buck brush, wild lilac)	Occasional
<i>Ceanothus thyrsoiflorus</i>	blueblossom	Occasional
<i>Ceanothus tomentosus</i>	woollyleaf ceanothus	Occasional
<i>Ceanothus velutinus</i>	Hooker's ceanothus	Occasional
<i>Ceanothus velutinus</i>	snowbrush ceanothus	Occasional
<i>Ceanothus verrucosus</i>	barranca brush	Occasional
<i>Cedrus</i> spp.	(cedar)	

<i>Centranthus</i>	centranthus	Occasional
<i>Centranthus ruber</i>	red valerian	Occasional
<i>Ceratostigma</i> spp.	(Chinese plumbago)	Occasional
<i>Cestrum</i>	jessamine	
<i>Cestrum elegans</i>	Cestrum	
<i>Cestrum fasciculatum</i>	early jessamine	
<i>Cestrum nocturnum</i>	night jessamine	
<i>Cestrum parqui</i>	Chilean jessamine	
<i>Chaenomeles</i> spp.	Flowering Quince	Very Common
<i>Chamaecyparis</i>	cedar	Occasional
<i>Chamaecyparis lawsoniana</i>	Port Orford cedar	Occasional
<i>Chamaecyparis</i> spp.	(false cypress, Port Orford cedar)	Occasional
<i>Chenopodium</i>	goosefoot	Occasional
<i>Chenopodium album</i>	lambsquarters	Occasional
<i>Chenopodium album</i>	lateflowering goosefoot	Occasional
<i>Chenopodium album</i>	Missouri lambsquarters	Occasional
<i>Chenopodium album</i>	Stevens' lambsquarters	Occasional
<i>Chenopodium ambrosioides</i>	Mexican tea	Occasional
<i>Chenopodium atrovirens</i>	pinyon goosefoot	Occasional
<i>Chenopodium berlandieri</i>	pitseed goosefoot	Occasional
<i>Chenopodium berlandieri</i>	pitseed goosefoot	Occasional
<i>Chenopodium berlandieri</i>	Zschack's goosefoot	Occasional
<i>Chenopodium botrys</i>	Jerusalem oak goosefoot	Occasional
<i>Chenopodium californicum</i>	California goosefoot	Occasional
<i>Chenopodium capitatum</i>	blite goosefoot	Occasional
<i>Chenopodium carnosulum</i>	ridged goosefoot	Occasional
<i>Chenopodium chenopodioides</i>	low goosefoot	Occasional
<i>Chenopodium desiccatum</i>	aridland goosefoot	Occasional
<i>Chenopodium foliosum</i>	leafy goosefoot	Occasional
<i>Chenopodium fremontii</i>	Fremont's goosefoot	Occasional
<i>Chenopodium hians</i>	hians goosefoot	Occasional
<i>Chenopodium humile</i>	marshland goosefoot	Occasional
<i>Chenopodium incanum</i>	mealy goosefoot	Occasional
<i>Chenopodium leptophyllum</i>	narrowleaf goosefoot	Occasional
<i>Chenopodium macrospermum</i>	largeseed goosefoot	Occasional
<i>Chenopodium macrospermum</i>	saltloving goosefoot	Occasional
<i>Chenopodium multifidum</i>	cutleaf goosefoot	Occasional
<i>Chenopodium murale</i>	nettleleaf goosefoot	Occasional
<i>Chenopodium nevadense</i>	Nevada goosefoot	Occasional
<i>Chenopodium opulifolium</i>	seaport goosefoot	Occasional
<i>Chenopodium overi</i>	Over's goosefoot	Occasional
<i>Chenopodium polyspermum</i>	manyseed goosefoot	Occasional
<i>Chenopodium pratericola</i>	desert goosefoot	Occasional
<i>Chenopodium pumilio</i>	clammy goosefoot	Occasional
<i>Chenopodium rubrum</i>	red goosefoot	Occasional
<i>Chenopodium salinum</i>	Rocky Mountain goosefoot	Occasional
<i>Chenopodium simplex</i>	mapleleaf goosefoot	Occasional
<i>Chenopodium</i> spp.	(fat-hen, lamb's quarters)	Occasional
<i>Chenopodium vulvaria</i>	stinking goosefoot	Occasional
<i>Chenopodium watsonii</i>	Watson's goosefoot	Occasional
<i>Chimonanthus</i> spp.	(Japanese allspice, wintersweet)	Occasional

<i>Choisya</i> spp.	(Mexican orange)	Common
<i>Choisya ternata</i>	Mexican Orange	Common
<i>Chrysanthemum</i>	daisy	Common
<i>Chrysanthemum xmorifolium</i>	florist's daisy	Common
<i>Chrysanthemum maxium</i>	Shasta Daisy	Common
<i>Chrysanthemum</i> spp.	(chrysanthemums)	Common
<i>Chrysanthemum x</i>	morifolium (florist mums)	Common
<i>Cirsium</i>	thistle	Common
<i>Cirsium andersonii</i>	rose thistle	Common
<i>Cirsium andrewsii</i>	Franciscan thistle	Common
<i>Cirsium arizonicum</i>	Arizona thistle	Common
<i>Cirsium arvense</i>	Canada thistle	Common
<i>Cirsium brevistylum</i>	clustered thistle	Common
<i>Cirsium canescens</i>		Common
<i>Cirsium canovirens</i>	graygreen thistle	Common
<i>Cirsium ciliolatum</i>	Ashland thistle	Common
<i>Cirsium crassicaule</i>	slough thistle	Common
<i>Cirsium cymosum</i>	peregrine thistle	Common
<i>Cirsium douglasii</i>	Douglas' thistle	Common
<i>Cirsium fontinale</i>	Chorro Creek Bog thistle	Common
<i>Cirsium fontinale</i>	fountain thistle	Common
<i>Cirsium fontinale</i>	Mt Hamilton thistle	Common
<i>Cirsium hydrophilum</i>	Suisun thistle	Common
<i>Cirsium hydrophilum</i>	Suisun thistle	Common
<i>Cirsium hydrophilum</i>	Vasey's thistle	Common
<i>Cirsium inamoenum</i>		Common
<i>Cirsium loncholepis</i>	la graciosa thistle	Common
<i>Cirsium mohavense</i>	Mojave thistle	Common
<i>Cirsium neomexicanum</i>	New Mexico thistle	Common
<i>Cirsium occidentale</i>	cobwebby thistle	Common
<i>Cirsium occidentale</i>	compact cobwebby thistle	Common
<i>Cirsium occidentale</i>	snowy thistle	Common
<i>Cirsium ochrocentrum</i>	yellowspine thistle	Common
<i>Cirsium praeteriens</i>	Palo Alto thistle	Common
<i>Cirsium quercetorum</i>	Alameda County thistle	Common
<i>Cirsium remotifolium</i>	fewleaf thistle	Common
<i>Cirsium rhotophilum</i>	surf thistle	Common
<i>Cirsium scabrum</i>	rough thistle	Common
<i>Cirsium scariosum</i>	meadow thistle	Common
<i>Cirsium</i> spp.	(Arizona thistle, bull thistle, Canada thistle)	Common
<i>Cirsium subniveum</i>	Jackson Hole thistle	Common
<i>Cirsium undulatum</i>	wavyleaf thistle	Common
<i>Cirsium vulgare</i>	bull thistle	Common
<i>Citrus Limon</i>	Lemon	Common
<i>Citrus paradisiaca</i>	Grapfruit	Common
<i>Citrus sinensis</i>	Washington Navel	Common
<i>Citrus</i> spp.	Citrus	Common
<i>Clematis</i>	leather flower	Common
<i>Clematis drummondii</i>		Common
<i>Clematis lasiantha</i>	pipestem clematis	Common
<i>Clematis ligusticifolia</i>	California clematis	Common

<i>Clematis ligusticifolia</i>	western white clematis	Common
<i>Clematis pauciflora</i>	ropevine clematis	Common
<i>Clematis</i> spp.	(clematis, virgin's bower, lather flower, vase vine)	Common
<i>Clematis terniflora</i>	sweet autumn virginsbower	Common
<i>Clematis vitalba</i>	evergreen clematis	Common
<i>Clerodendron</i> spp.		
<i>Clethra</i> spp.	(white alder, summer-sweet)	Occasional
<i>Clianthus</i> spp.	(desert pea, glory pea, parrot's-beak)	Very Common
<i>Convolvulus</i>	bindweed	Occasional
<i>Convolvulus althaeoides</i>	mallow bindweed	Occasional
<i>Convolvulus arvensis</i>	field bindweed	Occasional
<i>Convolvulus equitans</i>	Texas bindweed	Occasional
<i>Convolvulus</i> spp.	(field bindweed, dwarf morning-glory)	Occasional
<i>Convolvulus tricolor</i>	dwarf morning-glory	Occasional
<i>Conyza</i>	horseweed	Common
<i>Conyza bonariensis</i>	asthmaweed	Common
<i>Conyza canadensis</i>	Canadian horseweed	Common
<i>Conyza floribunda</i>	asthmaweed	Common
<i>Conyza</i> spp.	(fleabane, horsethistle)	Common
<i>Coprosma</i>	mirrorplant	
<i>Coprosma repens</i>	creeping mirrorplant	
<i>Coprosma</i> spp.		
<i>Cordyline</i>	cordyline	Occasional
<i>Cordyline australis</i>	cabbage tree	Occasional
<i>Cordyline</i> spp.	(cabbage tree, dracaena, good-luck plant)	Occasional
<i>Coriaria</i> spp.	(tanner's tree)	Occasional
<i>Cornus</i>	dogwood	
<i>Cornus canadensis</i>		
<i>Cornus glabrata</i>	brown dogwood	
<i>Cornus nuttallii</i>	Pacific dogwood	
<i>Cornus sericea</i>	redosier dogwood	
<i>Cornus sericea</i>	western dogwood	
<i>Cornus sessilis</i>	blackfruit dogwood	
<i>Cornus unalaschensis</i>	western cordilleran bunchberry	
<i>Correa</i> spp.	Carmine Bells	Common
<i>Cotoneaster</i>	cotoneaster	Very Common
<i>Cotoneaster franchetii</i>	orange cotoneaster	Very Common
<i>Cotoneaster lacteus</i>	milkflower cotoneaster	Very Common
<i>Cotoneaster pannosus</i>	silverleaf cotoneaster	Very Common
<i>Cotoneaster</i> spp.	Cotoneaster	Very Common
<i>Crataegus</i>	hawthorn	Very Common
<i>Crataegus douglasii</i>	black hawthorn	Very Common
<i>Crataegus monogyna</i>	oneseed hawthorn	Very Common
<i>Crataegus</i> spp.	(hawthorn)	Very Common
<i>Crataegus suksdorfii</i>	Suksdorf's hawthorn	Very Common
<i>Crococsmia</i>	crococsmia	Common
<i>Crococsmia xrococsmiiflora</i>	montbretia	Common
<i>Crococsmia</i> spp.	(montbretia)	Common
<i>Cryptomeria</i> spp.	(Japanese cedar)	
<i>Cryptostemma</i> spp.	(capeweed)	Common

<i>Cucumis</i>	melon	
<i>Cucumis anguria</i>	West Indian gherkin	
<i>Cucumis melo</i>	cantaloupe	
<i>Cucumis myriocarpus</i>	gooseberry gourd	
<i>Cucumis</i> spp.	(cantaloupe, cucumber, melon, muskmelon)	
<i>Cucurbita</i>	gourd	Occasional
<i>Cucurbita digitata</i>	fingerleaf gourd	Occasional
<i>Cucurbita ficifolia</i>	figleaf gourd	Occasional
<i>Cucurbita foetidissima</i>	Missouri gourd	Occasional
<i>Cucurbita palmata</i>	coyote gourd	Occasional
<i>Cucurbita pepo</i>	field pumpkin	Occasional
<i>Cucurbita pepo</i>		Occasional
<i>Cucurbita</i> spp.	(gourds, pumpkins, squashes)	Occasional
<i>Cupressus</i>	cypress	Occasional
<i>Cupressus abramsiana</i>	Santa Cruz Island cypress	Occasional
<i>Cupressus arizonica</i>	Arizona cypress	Occasional
<i>Cupressus arizonica</i>	Arizona cypress	Occasional
<i>Cupressus arizonica</i>	Cuyamaca cypress	Occasional
<i>Cupressus arizonica</i>	Paiute cypress	Occasional
<i>Cupressus bakeri</i>	Modoc cypress	Occasional
<i>Cupressus forbesii</i>	tecate cypress	Occasional
<i>Cupressus goveniana</i>	Gowen cypress	Occasional
<i>Cupressus goveniana</i>	Gowen cypress	Occasional
<i>Cupressus goveniana</i>	pygmy cypress	Occasional
<i>Cupressus guadalupensis</i>		Occasional
<i>Cupressus macnabiana</i>	MacNab's cypress	Occasional
<i>Cupressus macrocarpa</i>	Monterey cypress	Occasional
<i>Cupressus nootkatensis</i>	Alaska cedar	Occasional
<i>Cupressus sargentii</i>	Sargent's cypress	Occasional
<i>Cupressus</i> spp.	(cypress)	Occasional
<i>Cydonia</i>	cydonia	Very Common
<i>Cydonia oblonga</i>	quince	Very Common
<i>Cydonia</i> spp.	(quince)	Very Common
<i>Cyphomandra</i> spp.	(tamarillo, tree tomato, tomato tree)	
<i>Cytisus</i>	broom	Very Common
<i>Cytisus xdallimorei</i>		Very Common
<i>Cytisus multiflorus</i>	white spanishbroom	Very Common
<i>Cytisus scoparius</i>	Scotch broom	Very Common
<i>Cytisus</i> spp.	(genista, Scotch broom, Spanish broom, white Spanish)	Very Common
<i>Cytisus striatus</i>	striated broom	Very Common
<i>Dahlia</i> spp.	(dahlia)	Common
<i>Datura</i>	jimsonweed	Occasional
<i>Datura discolor</i>	desert thorn-apple	Occasional
<i>Datura innoxia</i>	pricklyburr	Occasional
<i>Datura quercifolia</i>	Chinese thorn-apple	Occasional
<i>Datura</i> spp.	(angel's trumpet, Jimson weed, thorn apple)	Occasional
<i>Datura stramonium</i>	jimsonweed	Occasional
<i>Datura wrightii</i>	sacred thorn-apple	Occasional
<i>Daucus</i>	wild carrot	Occasional
<i>Daucus carota</i>	Queen Anne's lace	Occasional

<i>Daucus pusillus</i>	American wild carrot	Occasional
<i>Daucus</i> spp.	(carrot, Queen Anne's lace)	Occasional
<i>Dendromecon</i>	tree poppy	
<i>Dendromecon californica</i>	Bush Poppy	
<i>Dendromecon harfordii</i>	Harford's tree poppy	
<i>Dendromecon rigida</i>	tree poppy	
<i>Deutzia</i> spp.	Deutzia	Occasional
<i>Diospyros</i>	diospyros	Occasional
<i>Diospyros</i> spp.	(ebony, persimmon)	Occasional
<i>Diospyros virginiana</i>	common persimmon	Occasional
<i>Dodonaea</i>	dodonaea	Occasional
<i>Dodonaea</i> spp.	((hop bush, hopseed bush)	Occasional
<i>Dodonaea viscosa</i>	Florida hopbush	Occasional
<i>Duchesnea</i>	duchesnea	Very Common
<i>Duchesnea indica</i>	Indian strawberry	Very Common
<i>Elaeagnus</i>	elaeagnus	
<i>Elaeagnus angustifolia</i>	Russian olive	
<i>Elaeagnus pungens</i>	Silberberry	
<i>Epilobium</i>	willowherb	
<i>Epilobium anagallidifolium</i>	pimpernel willowherb	
<i>Epilobium brachycarpum</i>	tall annual willowherb	
<i>Epilobium canum</i>	hummingbird trumpet	
<i>Epilobium ciliatum</i>	fringed willowherb	
<i>Epilobium ciliatum</i>	fringed willowherb	
<i>Epilobium ciliatum</i>	fringed willowherb	
<i>Epilobium clavatum</i>	talus willowherb	
<i>Epilobium cleistogamum</i>	selfing willowherb	
<i>Epilobium densiflorum</i>	denseflower willowherb	
<i>Epilobium foliosum</i>	California willowherb	
<i>Epilobium glaberrimum</i>	glaucus willowherb	
<i>Epilobium halleanum</i>	glandular willowherb	
<i>Epilobium hornemannii</i>	Hornemann's willowherb	
<i>Epilobium hornemannii</i>	Hornemann's willowherb	
<i>Epilobium howellii</i>	Yuba Pass willowherb	
<i>Epilobium lactiflorum</i>	milkflower willowherb	
<i>Epilobium leptophyllum</i>	bog willowherb	
<i>Epilobium luteum</i>	yellow willowherb	
<i>Epilobium minutum</i>	chaparral willowherb	
<i>Epilobium nivium</i>	Snow Mountain willowherb	
<i>Epilobium obcordatum</i>	rockfringe	
<i>Epilobium oregonum</i>	Grants Pass willowherb	
<i>Epilobium oregonense</i>	Oregon willowherb	
<i>Epilobium pallidum</i>	largeflower spike-primrose	
<i>Epilobium palustre</i>	marsh willowherb	
<i>Epilobium pygmaeum</i>	smooth spike-primrose	
<i>Epilobium rigidum</i>	stiff willowherb	
<i>Epilobium saximontanum</i>	Rocky Mountain willowherb	
<i>Epilobium septentrionale</i>	northern willowherb	
<i>Epilobium siskiyouense</i>	Siskiyou willowherb	
<i>Epilobium</i> spp.	(fireweed)	
<i>Epilobium torreyi</i>	Torrey's willowherb	

<i>Erica</i>	heath	Common
<i>Erica lusitanica</i>	Spanish heath	Common
<i>Erica</i> spp.	(heath, heather)	Common
<i>Eriobotrya</i>	loquat	Very Common
<i>Eriobotrya japonica</i>	loquat	Very Common
<i>Eriobotrya</i> spp.	(loquat)	Very Common
<i>Eriostemon</i> spp.	(pink star, wax flower)	Common
<i>Erodium</i>	stork's bill	Occasional
<i>Erodium botrys</i>	longbeak stork's bill	Occasional
<i>Erodium brachycarpum</i>	shortfruit stork's bill	Occasional
<i>Erodium cicutarium</i>	redstem stork's bill	Occasional
<i>Erodium cygnorum</i>	Australian stork's bill	Occasional
<i>Erodium macrophyllum</i>	California stork's bill	Occasional
<i>Erodium macrophyllum</i>	roundleaf stork's bill	Occasional
<i>Erodium malacoides</i>	Mediterranean stork's bill	Occasional
<i>Erodium moschatum</i>	musky stork's bill	Occasional
<i>Erodium</i> spp.	(cranesbill, filaree)	Occasional
<i>Erodium texanum</i>	Texas stork's bill	Occasional
<i>Escallonia</i>	redclaws	Occasional
<i>Escallonia compacta</i>	Escallonia	Occasional
<i>Escallonia rubra</i>	redclaws	Occasional
<i>Escallonia</i> spp.		Occasional
<i>Eucalyptus</i>	gum	Primary
<i>Eucalyptus xmortonia</i>		Primary
<i>Eucalyptus camaldulensis</i>	river redgum	Primary
<i>Eucalyptus cladocalyx</i>	sugargum	Primary
<i>Eucalyptus globulus</i>	Tasmanian bluegum	Primary
<i>Eucalyptus polyanthemos</i>	redbox	Primary
<i>Eucalyptus pulverulenta</i>	silverleaf mountain gum	Primary
<i>Eucalyptus sideroxylon</i>	red ironbark	Primary
<i>Eucalyptus</i> spp.	(eucalyptus, gum trees)	Primary
<i>Eucalyptus tereticornis</i>	forest redgum	Primary
<i>Eucalyptus torquata</i>	coral gum	Primary
<i>Eucalyptus viminalis</i>	mannan gum	Primary
<i>Eugenia</i>	stopper	Occasional
<i>Eugenia apiculata</i>	shortleaf stopper	Occasional
<i>Eugenia</i> spp.	(cherry of the Rio Grande, Lilly Pilly, Surinam cherry)	Occasional
<i>Euonymus</i>	spindletree	Occasional
<i>Euonymus occidentale</i>	western burning bush	Occasional
<i>Euonymus occidentalis</i>		Occasional
<i>Euonymus</i> spp.	(euonymus, spindle tree)	Occasional
<i>Euphorbia</i>	spurge	
<i>Euphorbia characias</i>	Albanian spurge	
<i>Euphorbia crenulata</i>	Chinese caps	
<i>Euphorbia cyathophora</i>	fire on the mountain	
<i>Euphorbia cyparissias</i>	cypress spurge	
<i>Euphorbia davidii</i>	David's spurge	
<i>Euphorbia dendroides</i>	tree spurge	
<i>Euphorbia dentata</i>	toothed spurge	
<i>Euphorbia eriantha</i>	beetle spurge	

<i>Euphorbia esula</i>	leafy spurge	
<i>Euphorbia exigua</i>	dwarf spurge	
<i>Euphorbia exstipulata</i>	squareseed spurge	
<i>Euphorbia helioscopia</i>	madwoman's milk	
<i>Euphorbia heterophylla</i>	Mexican fireplant	
<i>Euphorbia lathyris</i>	moleplant	
<i>Euphorbia marginata</i>	snow on the mountain	
<i>Euphorbia misera</i>	cliff spurge	
<i>Euphorbia myrsinites</i>	myrtle spurge	
<i>Euphorbia oblongata</i>	eggleaf spurge	
<i>Euphorbia palmeri</i>	woodland spurge	
<i>Euphorbia pepus</i>	petty spurge	
<i>Euphorbia rigida</i>	upright myrtle spurge	
<i>Euphorbia schizoloba</i>	Mojave spurge	
<i>Euphorbia serrata</i>	serrate spurge	
<i>Euphorbia spathulata</i>	warty spurge	
<i>Euphorbia</i> spp.	(euphorbia, spurges)	
<i>Euphorbia terracina</i>	Geraldton carnation weed	
<i>Euphorbia tirucalli</i>	Indiantree spurge	
<i>Fagus</i> spp.	(beech)	Occasional
<i>Feijoa sellowiana</i>	Pineapple Guava	Primary
<i>Feijoa</i> spp.	(feijoa, pineapple guava)	Primary
<i>Ficus</i>	fig	Occasional
<i>Ficus carica</i>	edible fig	Occasional
<i>Ficus palmata</i>	Punjab fig	Occasional
<i>Ficus rubiginosa</i>	Port Jackson fig	Occasional
<i>Ficus</i> spp.	Climbing Fig	Occasional
<i>Forsythia</i> spp.	(forsythias)	Occasional
<i>Fortunella</i>	kumquat	Common
<i>Fortunella japonica</i>	round kumquat	Common
<i>Fortunella</i> spp.	(kumquats)	Common
<i>Fragaria</i>	strawberry	Very Common
<i>Fragaria xananassa</i>		Very Common
<i>Fragaria xbringhurstii</i>		Very Common
<i>Fragaria chiloensis</i>	beach strawberry	Very Common
<i>Fragaria chiloensis</i>	Pacific beach strawberry	Very Common
<i>Fragaria</i> spp.	(strawberry)	Very Common
<i>Fragaria vesca</i>	California strawberry	Very Common
<i>Fragaria vesca</i>	woodland strawberry	Very Common
<i>Fragaria virginiana</i>	Virginia strawberry	Very Common
<i>Fraxinus</i>	ash	
<i>Fraxinus anomala</i>	singleleaf ash	
<i>Fraxinus dipetala</i>	California ash	
<i>Fraxinus latifolia</i>	Oregon ash	
<i>Fraxinus</i> spp.	(ash)	
<i>Fraxinus uhdei</i>	shamel ash	
<i>Fraxinus velutina</i>	velvet ash	
<i>Fuchsia</i>	fuchsia	Occasional
<i>Fuchsia boliviana</i>	Bolivian fuchsia	Occasional
<i>Fuchsia hybrida</i>	hybrid fuchsia	Occasional
<i>Fuchsia magellanica</i>	hardy fuchsia	Occasional

<i>Fuchsia paniculata</i>	shrubby fuchsia	Occasional
<i>Fuchsia</i> spp.	Fuchsia	Occasional
<i>Fumaria</i>	fumitory	
<i>Fumaria capreolata</i>	white ramping fumitory	
<i>Fumaria officinalis</i>	drug fumitory	
<i>Fumaria parviflora</i>	fineleaf fumitory	
<i>Fumaria</i> spp.	(fumitory)	
<i>Garrya</i>	silktassel	Occasional
<i>Garrya buxifolia</i>	dwarf silktassel	Occasional
<i>Garrya congdonii</i>	chaparral silktassel	Occasional
<i>Garrya elliptica</i>	wavyleaf silktassel	Occasional
<i>Garrya flavescens</i>	ashy silktassel	Occasional
<i>Garrya fremontii</i>	bearbrush	Occasional
<i>Garrya</i> spp.	(silk-tassel)	Occasional
<i>Garrya veatchii</i>	canyon silktassel	Occasional
<i>Gelsemium</i> spp.	(Carolina jessamine)	Occasional
<i>Genista</i>	broom	Very Common
<i>Genista aetnensis</i>	Mt. Etna broom	Very Common
<i>Genista canariensis</i>	Canary broom	Very Common
<i>Genista linifolia</i>	Mediterranean broom	Very Common
<i>Genista maderensis</i>	Madeira Dyer's greenweed	Very Common
<i>Genista monspessulana</i>	French broom	Very Common
<i>Genista</i> spp.	(brooms)	Very Common
<i>Genista stenopetala</i>	leafy broom	Very Common
<i>Geranium</i>	geranium	Occasional
<i>Geranium bicknellii</i>	Bicknell's cranesbill	Occasional
<i>Geranium californicum</i>	California cranesbill	Occasional
<i>Geranium carolinianum</i>	Carolina geranium	Occasional
<i>Geranium carolinianum</i>	Carolina geranium	Occasional
<i>Geranium carolinianum</i>	Carolina geranium	Occasional
<i>Geranium columbinum</i>	longstalk cranesbill	Occasional
<i>Geranium dissectum</i>	cutleaf geranium	Occasional
<i>Geranium homeanum</i>	Australasian geranium	Occasional
<i>Geranium lucidum</i>	shining geranium	Occasional
<i>Geranium molle</i>	dovefoot geranium	Occasional
<i>Geranium nervosum</i>		Occasional
<i>Geranium oreganum</i>	Oregon geranium	Occasional
<i>Geranium palmatum</i>	Canary Island geranium	Occasional
<i>Geranium potentilloides</i>	cinquefoil geranium	Occasional
<i>Geranium pusillum</i>	small geranium	Occasional
<i>Geranium pyrenaicum</i>	hedgerow geranium	Occasional
<i>Geranium retrorsum</i>	New Zealand geranium	Occasional
<i>Geranium richardsonii</i>	Richardson's geranium	Occasional
<i>Geranium robertianum</i>		Occasional
<i>Geranium robertianum</i>	Robert geranium	Occasional
<i>Geranium robertianum</i>	Robert geranium	Occasional
<i>Geranium rotundifolium</i>	roundleaf geranium	Occasional
<i>Geranium sibiricum</i>	Siberian geranium	Occasional
<i>Geranium solanderi</i>	Solander's geranium	Occasional
<i>Geranium</i> spp.	(cranesbill)	Occasional
<i>Geranium texanum</i>	Texas geranium	Occasional

<i>Geranium viscosissimum</i>	sticky purple geranium	Occasional
<i>Gerbera</i> spp.	(Transvaal daisy)	Common
<i>Gomphocarpus</i> spp.	(cotton bush, hairy balls, wild cotton)	Occasional
<i>Grevillea</i> spp.	(hummingbird bush, grevilleas, silky-oak)	Occasional
<i>Gypsophila</i>	baby's-breath	
<i>Gypsophila elegans</i>	showy baby's-breath	
<i>Gypsophila paniculata</i>	baby's breath	
<i>Gypsophila scorzonerifolia</i>	garden baby's-breath	
<i>Gypsophila</i> spp.	(baby's-breath)	
<i>Hakea</i> spp.	(pincushion tree)	Occasional
<i>Haloragis</i>	seaberry	Occasional
<i>Haloragis erecta</i>	erect seaberry	Occasional
<i>Haloragis</i> spp.	(erect seaberry, seaberry)	Occasional
<i>Hardenbergia</i> spp.	(coral pea, lilac vine)	Very Common
<i>Hebe</i>	hebe	Occasional
<i>Hebe xfranciscana</i>		Occasional
<i>Hebe speciosa</i>	New Zealand hebe	Occasional
<i>Hedera</i>	ivy	Occasional
<i>Hedera canariensis</i>	Canary ivy	Occasional
<i>Hedera helix</i>	English ivy	Occasional
<i>Hedera</i> spp.	(ivy)	Occasional
<i>Helianthus</i>	sunflower	Common
<i>Helianthus annuus</i>	common sunflower	Common
<i>Helianthus bolanderi</i>	serpentine sunflower	Common
<i>Helianthus californicus</i>	California sunflower	Common
<i>Helianthus ciliaris</i>	Texas blueweed	Common
<i>Helianthus cusickii</i>	Cusick's sunflower	Common
<i>Helianthus gracilentus</i>	slender sunflower	Common
<i>Helianthus maximiliani</i>	Maximilian sunflower	Common
<i>Helianthus niveus</i>	Algodones sunflower	Common
<i>Helianthus niveus</i>	showy sunflower	Common
<i>Helianthus nuttallii</i>	Nuttall's sunflower	Common
<i>Helianthus nuttallii</i>	Parish's sunflower	Common
<i>Helianthus petiolaris</i>	prairie sunflower	Common
<i>Helianthus</i> spp.	(Jerusalem artichoke, sunflower)	Common
<i>Helianthus tuberosus</i>	Jerusalem artichoke	Common
<i>Helichrysum</i>	strawflower	Common
<i>Helichrysum petiolare</i>	licorice-plant	Common
<i>Helichrysum</i> spp.	(curry plant, licorice plant, straw flower)	Common
<i>Heteromeles</i>	toyon	
<i>Heteromeles arbutifolia</i>		
<i>Heteromeles salicifolia</i>		
<i>Hibiscus</i>	rosemallow	
<i>Hibiscus denudatus</i>	paleface	
<i>Hibiscus lasiocarpus</i>	rosemallow	
<i>Hibiscus</i> spp.	Hibiscus	
<i>Hibiscus syriacus</i>	Hibiscus	
<i>Hibiscus trionum</i>	flower of an hour	
<i>Hoheria</i>		Occasional
<i>Hoheria populnea</i>	lacebark	Occasional
<i>Hoheria</i> spp.	(lacebark)	Occasional

<i>Holcus</i>	velvetgrass	Occasional
<i>Holcus lanatus</i>	common velvetgrass	Occasional
<i>Holcus mollis</i>	creeping velvetgrass	Occasional
<i>Holcus</i> spp.	(velvet grass)	Occasional
<i>Humulus</i>	hop	Primary
<i>Humulus lupulus</i>	common hop	Primary
<i>Humulus</i> spp.	(hops)	Primary
<i>Hydrangea quercifolia</i>	Oak Leaf Hydrangea	
<i>Hypericum</i>	St. Johnswort	Common
<i>Hypericum anagalloides</i>	tinker's penny	Common
<i>Hypericum androsaemum</i>	sweet-amber	Common
<i>Hypericum calycinum</i>	Aaron's beard	Common
<i>Hypericum canariense</i>	Canary Island St. Johnswort	Common
<i>Hypericum concinnum</i>	goldwire	Common
<i>Hypericum hookerianum</i>	Hooker's St. Johnswort	Common
<i>Hypericum mutilum</i>	dwarf St. Johnswort	Common
<i>Hypericum perforatum</i>	common St. Johnswort	Common
<i>Hypericum scouleri</i>	Scouler's St. Johnswort	Common
<i>Hypericum</i> spp.	(Aaron's beard, sweet-amber, St John's wort)	Common
<i>Ilex</i>	holly	Occasional
<i>Ilex xattenuata</i>	topal holly	Occasional
<i>Ilex aquifolium</i>	English holly	Occasional
<i>Ilex</i> spp.	(holly)	Occasional
<i>Iris</i>	iris	Occasional
<i>Iris bracteata</i>	Siskiyou iris	Occasional
<i>Iris chrysophylla</i>	yellowleaf iris	Occasional
<i>Iris douglasiana</i>	Douglas iris	Occasional
<i>Iris fernaldii</i>	Fernald's iris	Occasional
<i>Iris foetidissima</i>	stinking iris	Occasional
<i>Iris germanica</i>	German iris	Occasional
<i>Iris hartwegii</i>	rainbow iris	Occasional
<i>Iris innominata</i>	Del Norte County iris	Occasional
<i>Iris longipetala</i>		Occasional
<i>Iris macrosiphon</i>	bowltube iris	Occasional
<i>Iris missouriensis</i>	Rocky Mountain iris	Occasional
<i>Iris munzii</i>	Munz's iris	Occasional
<i>Iris orientalis</i>	yellowband iris	Occasional
<i>Iris pseudacorus</i>	paleyellow iris	Occasional
<i>Iris purdyi</i>	Purdy's iris	Occasional
<i>Iris sibirica</i>	Siberian iris	Occasional
<i>Iris</i> spp.	(iris)	Occasional
<i>Iris spuria</i>	seashore iris	Occasional
<i>Iris tenax</i>	Klamath iris	Occasional
<i>Iris tenax</i>	toughleaf iris	Occasional
<i>Iris tenuissima</i>	longtube iris	Occasional
<i>Iris thompsonii</i>	Thompson's iris	Occasional
<i>Jasminum</i> spp.	(jasmine)	Occasional
<i>Juglans</i>	walnut	Occasional
<i>Juglans californica</i>	Southern California walnut	Occasional
<i>Juglans hindsii</i>	Northern California walnut	Occasional
<i>Juglans regia</i>	English walnut	Occasional

<i>Juglans</i> spp.	(California black walnut, butternut, English walnut)	Occasional
<i>Juncus</i>	rush	
<i>Juncus acuminatus</i>	tapertip rush	
<i>Juncus acutus</i>	Leopold's rush	
<i>Juncus acutus</i>	spiny rush	
<i>Juncus ambiguus</i>	seasice rush	
<i>Juncus arcticus</i>	Baltic rush	
<i>Juncus articulatus</i>	jointleaf rush	
<i>Juncus balticus</i>		
<i>Juncus bolanderi</i>	Bolander's rush	
<i>Juncus brachyphyllus</i>	tuftedstem rush	
<i>Juncus breweri</i>	Brewer's rush	
<i>Juncus bryoides</i>	moss rush	
<i>Juncus bufonius</i>	toad rush	
<i>Juncus capillaris</i>	hairystem dwarf rush	
<i>Juncus capitatus</i>	leafybract dwarf rush	
<i>Juncus chlorocephalus</i>	greenhead rush	
<i>Juncus confusus</i>	Colorado rush	
<i>Juncus cooperi</i>	Cooper's rush	
<i>Juncus covillei</i>	Coville's rush	
<i>Juncus cyperoides</i>	Forbestown rush	
<i>Juncus diffusissimus</i>	slimpod rush	
<i>Juncus drummondii</i>	Drummond's rush	
<i>Juncus drummondii</i>	threeflower rush	
<i>Juncus dubius</i>	dubius rush	
<i>Juncus dudleyi</i>	Dudley's rush	
<i>Juncus duranii</i>	Duran's rush	
<i>Juncus effusus</i>	common rush	
<i>Juncus effusus</i>	lamp rush	
<i>Juncus effusus</i>	Pacific rush	
<i>Juncus ensifolius</i>	swordleaf rush	
<i>Juncus falcatus</i>	falcate rush	
<i>Juncus hemiendytus</i>	Herman's dwarf rush	
<i>Juncus hemiendytus</i>	Herman's dwarf rush	
<i>Juncus howellii</i>	Howell's rush	
<i>Juncus kelloggii</i>	Kellogg's dwarf rush	
<i>Juncus leiospermus</i>	Ahart's dwarf rush	
<i>Juncus leiospermus</i>	Red Bluff dwarf rush	
<i>Juncus lesueurii</i>	salt rush	
<i>Juncus longistylis</i>	longstyle rush	
<i>Juncus luciensis</i>	Santa Lucia dwarf rush	
<i>Juncus macrandrus</i>	longanther rush	
<i>Juncus macrophyllus</i>	longleaf rush	
<i>Juncus marginatus</i>	grassleaf rush	
<i>Juncus mertensianus</i>	Mertens' rush	
<i>Juncus mexicanus</i>	Mexican rush	
<i>Juncus nevadensis</i>	Sierra rush	
<i>Juncus nodatus</i>	stout rush	
<i>Juncus nodosus</i>	knotted rush	
<i>Juncus occidentalis</i>	western rush	

<i>Juncus orthophyllus</i>	straightleaf rush	
<i>Juncus oxymeris</i>	pointed rush	
<i>Juncus parryi</i>	Parry's rush	
<i>Juncus patens</i>	spreading rush	
<i>Juncus phaeocephalus</i>	brownhead rush	
<i>Juncus regelii</i>	Regel's rush	
<i>Juncus rugulosus</i>	wrinkled rush	
<i>Juncus saximontanus</i>	Rocky Mountain rush	
<i>Juncus</i> spp.	(rush)	
<i>Juncus supiniformis</i>	hairyleaf rush	
<i>Juncus tenuis</i>	poverty rush	
<i>Juncus textilis</i>	basket rush	
<i>Juncus tiehmii</i>	Nevada rush	
<i>Juncus torreyi</i>	Torrey's rush	
<i>Juncus triflorus</i>	Yosemite dwarf rush	
<i>Juncus uncialis</i>	twelfth rush	
<i>Juncus xiphioides</i>	irisleaf rush	
<i>Kerria</i> spp.	(Japanese kerria)	Very Common
<i>Kunzea</i> spp.	(Burgan)	
<i>Laburnum</i>	golden chain tree	Very Common
<i>Laburnum anagyroides</i>	golden chain tree	Very Common
<i>Laburnum</i> spp.	(bean treegolden-chain)	Very Common
<i>Lagerstroemia indica</i>	Crape Myrtle	
<i>Lagunaria</i> spp.	(cow itch tree, Hercules' club, white field gourd)	
<i>Lantana</i>	lantana	Occasional
<i>Lantana camara</i>	lantana	Occasional
<i>Lantana montevidensis</i>	trailing shrubverbena	Occasional
<i>Lantana</i> spp.	Lantana	Occasional
<i>Lantana urticoides</i>	West Indian shrubverbena	Occasional
<i>Lathyrus</i>	pea	Very Common
<i>Lathyrus angulatus</i>	angled pea	Very Common
<i>Lathyrus aphaca</i>	yellow pea	Very Common
<i>Lathyrus biflorus</i>	twoflower pea	Very Common
<i>Lathyrus bijugatus</i>	drypark pea	Very Common
<i>Lathyrus cicera</i>	red pea	Very Common
<i>Lathyrus delnorticus</i>	Del Norte pea	Very Common
<i>Lathyrus glandulosus</i>	redwood pea	Very Common
<i>Lathyrus hirsutus</i>	Caley pea	Very Common
<i>Lathyrus hitchcockianus</i>	Bullfrog Mountain pea	Very Common
<i>Lathyrus japonicus</i>	beach pea	Very Common
<i>Lathyrus japonicus</i>	beach pea	Very Common
<i>Lathyrus jepsonii</i>	California pea	Very Common
<i>Lathyrus jepsonii</i>	Delta tule pea	Very Common
<i>Lathyrus lanszwertii</i>	Brown's pea	Very Common
<i>Lathyrus lanszwertii</i>	Lanszwert's pea	Very Common
<i>Lathyrus lanszwertii</i>	Nevada pea	Very Common
<i>Lathyrus lanszwertii</i>	Tracy's pea	Very Common
<i>Lathyrus latifolius</i>	perennial pea	Very Common
<i>Lathyrus littoralis</i>	silky beach pea	Very Common
<i>Lathyrus nevadensis</i>	Sierra pea	Very Common
<i>Lathyrus odoratus</i>	sweetpea	Very Common

<i>Lathyrus palustris</i>	marsh pea	Very Common
<i>Lathyrus polyphyllus</i>	leafy pea	Very Common
<i>Lathyrus rigidus</i>	stiff pea	Very Common
<i>Lathyrus sativus</i>	white pea	Very Common
<i>Lathyrus sphaericus</i>	grass pea	Very Common
<i>Lathyrus splendens</i>	pride of California	Very Common
<i>Lathyrus</i> spp.	(sweet pea)	Very Common
<i>Lathyrus sulphureus</i>	snub pea	Very Common
<i>Lathyrus tingitanus</i>	Tangier pea	Very Common
<i>Lathyrus torreyi</i>	Torrey's pea	Very Common
<i>Lathyrus vestitus</i>	Alefeld's pea	Very Common
<i>Lathyrus vestitus</i>	Bolander's pea	Very Common
<i>Lathyrus vestitus</i>	Pacific pea	Very Common
<i>Laurus</i>	laurel	Occasional
<i>Laurus nobilis</i>	Sweet Bay	Occasional
<i>Laurus nobilis</i>	Sweet Bay	Occasional
<i>Laurus</i> spp.	(Grecian laurel, sweet bay)	Occasional
<i>Lavandula</i>	lavender	
<i>Lavandula</i> spp.		
<i>Lavandula stoechas</i>	French lavender	
<i>Leptospermum</i>	teatree	Occasional
<i>Leptospermum laevigatum</i>	Australian teatree	Occasional
<i>Leptospermum</i> spp.	(tea trees)	Occasional
<i>Leucadendron</i> spp.		
<i>Ligustrum</i>	privet	Primary
<i>Ligustrum lucidum</i>		Primary
<i>Ligustrum ovalifolium</i>	California privet	Primary
<i>Ligustrum</i> spp.	(privet)	Primary
<i>Lilium</i>	lily	Occasional
<i>Lilium bolanderi</i>	Bolander's lily	Occasional
<i>Lilium columbianum</i>	Columbia lily	Occasional
<i>Lilium humboldtii</i>	Humboldt lily	Occasional
<i>Lilium humboldtii</i>	Humboldt's lily	Occasional
<i>Lilium kelleyanum</i>	Kelley's lily	Occasional
<i>Lilium kelloggii</i>	Kellogg's lily	Occasional
<i>Lilium maritimum</i>	coast lily	Occasional
<i>Lilium occidentale</i>	western lily	Occasional
<i>Lilium pardalinum</i>	leopard lily	Occasional
<i>Lilium pardalinum</i>	Pitkin Marsh lily	Occasional
<i>Lilium pardalinum</i>	Shasta lily	Occasional
<i>Lilium pardalinum</i>	Vollmer's lily	Occasional
<i>Lilium pardalinum</i>	Wiggins' lily	Occasional
<i>Lilium parryi</i>	lemon lily	Occasional
<i>Lilium parvum</i>	Sierra tiger lily	Occasional
<i>Lilium rubescens</i>	redwood lily	Occasional
<i>Lilium</i> spp.	(lilies)	Occasional
<i>Lilium washingtonianum</i>	Cascade lily	Occasional
<i>Lilium washingtonianum</i>	washington lily	Occasional
<i>Lilium washingtonianum</i>	Washington lily	Occasional
<i>Linum</i>	flax	Occasional
<i>Linum bienne</i>	pale flax	Occasional

<i>Linum grandiflorum</i>	flowering flax	Occasional
<i>Linum lewisii</i>	Lewis flax	Occasional
<i>Linum lewisii</i>	prairie flax	Occasional
<i>Linum puberulum</i>	plains flax	Occasional
<i>Linum</i> spp.	(flax)	Occasional
<i>Linum trigynum</i>	French flax	Occasional
<i>Linum usitatissimum</i>	common flax	Occasional
<i>Litchi</i> spp.		Primary
<i>Lomandra</i> spp.	(mat-rush nyalla, tanika)	Common
<i>Lonicera</i>	honeysuckle	Occasional
<i>Lonicera caerulea</i>	bluefly honeysuckle	Occasional
<i>Lonicera caerulea</i>	sweetberry honeysuckle	Occasional
<i>Lonicera ciliosa</i>	orange honeysuckle	Occasional
<i>Lonicera conjugialis</i>	purpleflower honeysuckle	Occasional
<i>Lonicera etrusca</i>	Etruscan honeysuckle	Occasional
<i>Lonicera hispidula</i>	pink honeysuckle	Occasional
<i>Lonicera interrupta</i>	chaparral honeysuckle	Occasional
<i>Lonicera involucrata</i>	black twinberry	Occasional
<i>Lonicera involucrata</i>	fly honeysuckle	Occasional
<i>Lonicera japonica</i>	Honeysuckle	Occasional
<i>Lonicera japonica</i>	Honeysuckle	Occasional
<i>Lonicera</i> spp.	(honeysuckles)	Occasional
<i>Lonicera subspicata</i>	Johnston's honeysuckle	Occasional
<i>Lonicera subspicata</i>	Santa Barbara honeysuckle	Occasional
<i>Lonicera subspicata</i>	southern honeysuckle	Occasional
<i>Lonicera tatarica</i>	Tatarian honeysuckle	Occasional
<i>Loropetalum chinense</i>	Loropetalum	
<i>Lotus</i>	trefoil	Very Common
<i>Lotus aboriginus</i>	rosy bird's-foot trefoil	Very Common
<i>Lotus angustissimus</i>	slender bird's-foot trefoil	Very Common
<i>Lotus argophyllus</i>	Fremont's bird's-foot trefoil	Very Common
<i>Lotus argophyllus</i>	Santa Cruz Island silverhosackia	Very Common
<i>Lotus argophyllus</i>	Santa Cruz Island silverhosackia	Very Common
<i>Lotus argophyllus</i>	silver bird's-foot trefoil	Very Common
<i>Lotus argyraeus</i>	canyon bird's-foot trefoil	Very Common
<i>Lotus benthamii</i>	Bentham's broom	Very Common
<i>Lotus corniculatus</i>	bird's-foot trefoil	Very Common
<i>Lotus crassifolius</i>	big deervetch	Very Common
<i>Lotus dendroideus</i>	island broom	Very Common
<i>Lotus dendroideus</i>	Trask's island broom	Very Common
<i>Lotus dendroideus</i>	Veatch's island broom	Very Common
<i>Lotus denticulatus</i>	riverbar bird's-foot trefoil	Very Common
<i>Lotus formosissimus</i>	seaside bird's-foot trefoil	Very Common
<i>Lotus glaber</i>	narrow-leaf bird's-foot trefoil	Very Common
<i>Lotus grandiflorus</i>	chaparral bird's-foot trefoil	Very Common
<i>Lotus hamatus</i>	San Diego bird's-foot trefoil	Very Common
<i>Lotus haydonii</i>	rock bird's-foot trefoil	Very Common
<i>Lotus heermannii</i>	Heermann's bird's-foot trefoil	Very Common
<i>Lotus humistratus</i>	foothill deervetch	Very Common
<i>Lotus incanus</i>	woolly bird's-foot trefoil	Very Common
<i>Lotus junceus</i>	Biolett's rush broom	Very Common

<i>Lotus junceus</i>	rush broom	Very Common
<i>Lotus micranthus</i>	desert deervetch	Very Common
<i>Lotus nevadensis</i>	Davidson's bird's-foot trefoil	Very Common
<i>Lotus nevadensis</i>	Douglas' bird's-foot trefoil	Very Common
<i>Lotus nevadensis</i>	Nevada bird's-foot trefoil	Very Common
<i>Lotus nuttallianus</i>	wire bird's-foot trefoil	Very Common
<i>Lotus oblongifolius</i>	streambank bird's-foot trefoil	Very Common
<i>Lotus pedunculatus</i>	big trefoil	Very Common
<i>Lotus pinnatus</i>	meadow bird's-foot trefoil	Very Common
<i>Lotus procumbens</i>	Jepson's deerweed	Very Common
<i>Lotus procumbens</i>	silky deerweed	Very Common
<i>Lotus rigidus</i>	shrubby deervetch	Very Common
<i>Lotus rubriflorus</i>	redflower bird's-foot trefoil	Very Common
<i>Lotus salsuginosus</i>	coastal bird's-foot trefoil	Very Common
<i>Lotus scoparius</i>	common deerweed	Very Common
<i>Lotus scoparius</i>	western bird's-foot trefoil	Very Common
<i>Lotus spp.</i>	(bird's-foot trefoil, parrot's-beak, winged pea)	Very Common
<i>Lotus stipularis</i>	balsam bird's-foot trefoil	Very Common
<i>Lotus stipularis</i>	Ottley's bird's-foot trefoil	Very Common
<i>Lotus strigosus</i>	strigose bird's-foot trefoil	Very Common
<i>Lotus unifoliolatus</i>	American bird's-foot trefoil	Very Common
<i>Lotus wrangelianus</i>	Chilean bird's-foot trefoil	Very Common
<i>Lotus yollaboliensis</i>	Yolla Bolly bird's-foot trefoil	Very Common
<i>Luma apiculata</i>		
<i>Lupinus</i>	lupine	Very Common
<i>Lupinus xalpestris</i>	Great Basin lupine	Very Common
<i>Lupinus xcyamba-egressus</i>		Very Common
<i>Lupinus xinyoensis</i>		Very Common
<i>Lupinus abramsii</i>	Abrams' lupine	Very Common
<i>Lupinus adsurgens</i>	Drew's silky lupine	Very Common
<i>Lupinus affinis</i>	fleshy lupine	Very Common
<i>Lupinus agardhianus</i>	Agardh lupine	Very Common
<i>Lupinus albicaulis</i>	Shasta lupine	Very Common
<i>Lupinus albicaulis</i>	sicklekeel lupine	Very Common
<i>Lupinus albifrons</i>	Douglas' silver lupine	Very Common
<i>Lupinus albifrons</i>	silver lupine	Very Common
<i>Lupinus andersonii</i>	Anderson's lupine	Very Common
<i>Lupinus angustiflorus</i>	narrowflower lupine	Very Common
<i>Lupinus antoninus</i>	Anthony Peak lupine	Very Common
<i>Lupinus apertus</i>	summit lupine	Very Common
<i>Lupinus arboreus</i>	yellow bush lupine	Very Common
<i>Lupinus arbustus</i>	longspur lupine	Very Common
<i>Lupinus argenteus</i>	silvery lupine	Very Common
<i>Lupinus aridus</i>	desert lupine	Very Common
<i>Lupinus arizonicus</i>	Arizona lupine	Very Common
<i>Lupinus benthamii</i>	spider lupine	Very Common
<i>Lupinus bicolor</i>	miniature lupine	Very Common
<i>Lupinus brevicaulis</i>	shortstem lupine	Very Common
<i>Lupinus brevior</i>	short lupine	Very Common
<i>Lupinus breweri</i>	Brewer's lupine	Very Common
<i>Lupinus breweri</i>	matted lupine	Very Common

<i>Lupinus caespitosus</i>	stemless dwarf lupine	Very Common
<i>Lupinus caespitosus</i>	Utah lupine	Very Common
<i>Lupinus caudatus</i>	Kellogg's spurred lupine	Very Common
<i>Lupinus caudatus</i>	tailcup lupine	Very Common
<i>Lupinus cervinus</i>	Santa Lucia lupine	Very Common
<i>Lupinus chamissonis</i>	chamisso bush lupine	Very Common
<i>Lupinus citrinus</i>	orangeflower lupine	Very Common
<i>Lupinus citrinus</i>	orangeflower lupine	Very Common
<i>Lupinus concinnus</i>	bajada lupine	Very Common
<i>Lupinus concinnus</i>	Orcutt's lupine	Very Common
<i>Lupinus confertus</i>	crowded lupine	Very Common
<i>Lupinus congdonii</i>	Congdon's lupine	Very Common
<i>Lupinus constancei</i>	lassicus lupine	Very Common
<i>Lupinus covillei</i>	shaggy lupine	Very Common
<i>Lupinus croceus</i>	Mt. Eddy lupine	Very Common
<i>Lupinus culbertsonii</i>	Hoskett Meadows lupine	Very Common
<i>Lupinus dalesiae</i>	Quincy lupine	Very Common
<i>Lupinus densiflorus</i>	whitewhorl lupine	Very Common
<i>Lupinus duranii</i>	Mono Lake lupine	Very Common
<i>Lupinus elatus</i>	tall silky lupine	Very Common
<i>Lupinus elmeri</i>	Elmer's lupine	Very Common
<i>Lupinus excubitus</i>	grape soda lupine	Very Common
<i>Lupinus excubitus</i>	Hall's bush lupine	Very Common
<i>Lupinus excubitus</i>	interior bush lupine	Very Common
<i>Lupinus excubitus</i>	mountain bush lupine	Very Common
<i>Lupinus excubitus</i>	Mountain Springs bush lupine	Very Common
<i>Lupinus eximius</i>	San Mateo tree lupine	Very Common
<i>Lupinus flavoculatus</i>	yelloweyes	Very Common
<i>Lupinus formosus</i>	summer lupine	Very Common
<i>Lupinus fulcratus</i>	greenstipule lupine	Very Common
<i>Lupinus gracilentus</i>	green slender lupine	Very Common
<i>Lupinus grayi</i>	Sierra lupine	Very Common
<i>Lupinus guadalupensis</i>	Guadalupe Island lupine	Very Common
<i>Lupinus hirsutissimus</i>	stinging annual lupine	Very Common
<i>Lupinus holmgrenianus</i>	Holmgren's lupine	Very Common
<i>Lupinus horizontalis</i>	sunset lupine	Very Common
<i>Lupinus hyacinthinus</i>	San Jacinto lupine	Very Common
<i>Lupinus lapidicola</i>	Heller's dwarf lupine	Very Common
<i>Lupinus latifolius</i>	broadleaf lupine	Very Common
<i>Lupinus lepidus</i>		Very Common
<i>Lupinus leucophyllus</i>	velvet lupine	Very Common
<i>Lupinus littoralis</i>	seashore lupine	Very Common
<i>Lupinus longifolius</i>	longleaf bush lupine	Very Common
<i>Lupinus ludovicianus</i>	San Luis lupine	Very Common
<i>Lupinus luteolus</i>	pale yellow lupine	Very Common
<i>Lupinus lyallii</i>	dwarf mountain lupine	Very Common
<i>Lupinus magnificus</i>	Panamint Mountain lupine	Very Common
<i>Lupinus meionanthus</i>	Lake Tahoe lupine	Very Common
<i>Lupinus microcarpus</i>		Very Common
<i>Lupinus nanus</i>	Menker's lupine	Very Common
<i>Lupinus nanus</i>	sky lupine	Very Common

<i>Lupinus nevadensis</i>	Nevada lupine	Very Common
<i>Lupinus nipomensis</i>	Nipomo Mesa lupine	Very Common
<i>Lupinus obtusilobus</i>	bluntlobe lupine	Very Common
<i>Lupinus odoratus</i>	Mojave royal lupine	Very Common
<i>Lupinus onustus</i>	Plumas lupine	Very Common
<i>Lupinus pachylobus</i>	Mt. Diablo lupine	Very Common
<i>Lupinus padre-crowleyi</i>	Dedecker lupine	Very Common
<i>Lupinus pallidus</i>	pale desert lupine	Very Common
<i>Lupinus palmeri</i>	bluebonnet lupine	Very Common
<i>Lupinus peirsonii</i>	long lupine	Very Common
<i>Lupinus polycarpus</i>	smallflower lupine	Very Common
<i>Lupinus polyphyllus</i>	bigleaf lupine	Very Common
<i>Lupinus pratensis</i>	Inyo Meadow lupine	Very Common
<i>Lupinus prunophilus</i>	hairy bigleaf lupine	Very Common
<i>Lupinus punto-reyesensis</i>	Point reyes lupine	Very Common
<i>Lupinus purpurascens</i>	Yuba lupine	Very Common
<i>Lupinus pusillus</i>	Intermountain lupine	Very Common
<i>Lupinus pusillus</i>	rusty lupine	Very Common
<i>Lupinus rivularis</i>	riverbank lupine	Very Common
<i>Lupinus ruber</i>	red lupine	Very Common
<i>Lupinus saxosus</i>	rock lupine	Very Common
<i>Lupinus sellulus</i>	Donner Lake lupine	Very Common
<i>Lupinus sericatus</i>	Cobb Mountain lupine	Very Common
<i>Lupinus sericeus</i>		Very Common
<i>Lupinus shockleyi</i>	purple desert lupine	Very Common
<i>Lupinus sparsiflorus</i>	Mojave lupine	Very Common
<i>Lupinus sparsiflorus</i>	Pond's Mojave lupine	Very Common
<i>Lupinus spectabilis</i>	shaggyhair lupine	Very Common
<i>Lupinus</i> spp.	(lupines)	Very Common
<i>Lupinus stiversii</i>	harlequin annual lupine	Very Common
<i>Lupinus sublanatus</i>	Mono lupine	Very Common
<i>Lupinus subvexus</i>	valley lupine	Very Common
<i>Lupinus succulentus</i>	hollowleaf annual lupine	Very Common
<i>Lupinus tdestromii</i>	Tidestrom's lupine	Very Common
<i>Lupinus tdestromii</i>	Tidestrom's lupine	Very Common
<i>Lupinus tracyi</i>	Tracy's lupine	Very Common
<i>Lupinus truncatus</i>	collared annual lupine	Very Common
<i>Lupinus uncialis</i>	inchhigh lupine	Very Common
<i>Lupinus vallicola</i>	open lupine	Very Common
<i>Lupinus variicolor</i>		Very Common
<i>Lupinus versicolor</i>	manycolor lupine	Very Common
<i>Lycopersicom</i> spp.		
<i>Macadamia</i> spp.	(macadamia)	Occasional
<i>Magnolia</i> spp.	Magnolia	Occasional
<i>Malus</i>	apple	Very Common
<i>Malus fusca</i>	Oregon crabapple	Very Common
<i>Malus pumila</i>	paradise apple	Very Common
<i>Malus</i> spp.	Apple	Very Common
<i>Malus</i> spp.	Flowering CrabApple	Very Common
<i>Malva</i>	mallow	Occasional
<i>Malva assurgentiflora</i>		Occasional

<i>Malva moschata</i>	musk mallow	Occasional
<i>Malva neglecta</i>	common mallow	Occasional
<i>Malva nicaeensis</i>	bull mallow	Occasional
<i>Malva parviflora</i>	cheeseweed mallow	Occasional
<i>Malva pusilla</i>	low mallow	Occasional
<i>Malva</i> spp.	(mallow)	Occasional
<i>Malva sylvestris</i>	high mallow	Occasional
<i>Malva verticillata</i>	cluster mallow	Occasional
<i>Mangifera</i> spp.	(mango)	Occasional
<i>Medicago</i>	alfalfa	Very Common
<i>Medicago arabica</i>	spotted medick	Very Common
<i>Medicago lupulina</i>	black medick	Very Common
<i>Medicago minima</i>	burr medick	Very Common
<i>Medicago orbicularis</i>	blackdisk medick	Very Common
<i>Medicago polymorpha</i>	burclover	Very Common
<i>Medicago praecox</i>	Mediterranean medick	Very Common
<i>Medicago sativa</i>	alfalfa	Very Common
<i>Medicago sativa</i>	yellow alfalfa	Very Common
<i>Medicago</i> spp.	(alfalfa, bur clover, yellow trefoil)	Very Common
<i>Melaleuca quinquenervia</i>	Paperback Melaleuca	Occasional
<i>Melaleuca</i> spp.	(honey myrtle, bottlebrush)	Occasional
<i>Melilotus</i>	sweetclover	Very Common
<i>Melilotus indicus</i>	annual yellow sweetclover	Very Common
<i>Melilotus officinalis</i>	yellow sweetclover	Very Common
<i>Melilotus</i> spp.		Very Common
<i>Mentha</i>	mint	Occasional
<i>Mentha x piperita</i>	peppermint	Occasional
<i>Mentha x villosa</i>		Occasional
<i>Mentha aquatica</i>	water mint	Occasional
<i>Mentha arvensis</i>	wild mint	Occasional
<i>Mentha canadensis</i>		Occasional
<i>Mentha pulegium</i>	pennyroyal	Occasional
<i>Mentha spicata</i>	spearmint	Occasional
<i>Mentha</i> spp.	Mint	Occasional
<i>Mentha suaveolens</i>	apple mint	Occasional
<i>Mesembryanthemum</i>	iceplant	Occasional
<i>Mesembryanthemum crystallinum</i>	common iceplant	Occasional
<i>Mesembryanthemum nodiflorum</i>	slenderleaf iceplant	Occasional
<i>Mesembryanthemum</i> spp.	(ice plant)	Occasional
<i>Metrosideros</i> spp.	(bottlebrush, iron tree, New Zealand Christmas tree)	Occasional
<i>Michelia</i> spp.	(michelia)	Occasional
<i>Monotoca</i> spp.	(broomheaths)	Occasional
<i>Muehlenbeckia</i>	maidenhair vine	
<i>Muehlenbeckia complexa</i>	maidenhair vine	
<i>Muehlenbeckia hastatula</i>	wirevine	
<i>Muehlenbeckia</i> spp.	(maidenhair vine, wire plant)	
<i>Myoporum</i>	myoporum	
<i>Myoporum laetum</i>	ngaio tree	
<i>Myoporum</i> spp.	(myoporum, Ngaio-tree)	
<i>Myosotis</i>	forget-me-not	Occasional

<i>Myosotis azorica</i>	Azores forget-me-not	Occasional
<i>Myosotis discolor</i>	changing forget-me-not	Occasional
<i>Myosotis latifolia</i>	broadleaf forget-me-not	Occasional
<i>Myosotis laxa</i>	bay forget-me-not	Occasional
<i>Myosotis scorpioides</i>	true forget-me-not	Occasional
<i>Myosotis</i> spp.	(forget-me-not, scorpion grass)	Occasional
<i>Myosotis stricta</i>	strict forget-me-not	Occasional
<i>Myosotis sylvatica</i>	woodland forget-me-not	Occasional
<i>Myosotis verna</i>	spring forget-me-not	Occasional
<i>Myrica</i>	sweetgale	
<i>Myrica californica</i>	California Myrtle	
<i>Myrica hartwegii</i>	Sierra bayberry	
<i>Myrtus communis</i>	Myrtle	
<i>Nemesia</i> spp.	(nemesia)	Occasional
<i>Olea</i>	olive	
<i>Olea europaea</i>	Olive	
<i>Olea</i> spp.	Olive	
<i>Opuntia</i>	pricklypear	Occasional
<i>Opuntia xcurvospina</i>	searchlight pricklypear	Occasional
<i>Opuntia xdemissa</i>		Occasional
<i>Opuntia xoccidentalis</i>		Occasional
<i>Opuntia xvaseyi</i>	Vasey's coastal pricklypear	Occasional
<i>Opuntia basilaris</i>	beavertail pricklypear	Occasional
<i>Opuntia basilaris</i>	beavertail pricklypear	Occasional
<i>Opuntia basilaris</i>	Trelease's beavertail pricklypear	Occasional
<i>Opuntia chlorotica</i>	dollarjoint pricklypear	Occasional
<i>Opuntia engelmannii</i>	cactus apple	Occasional
<i>Opuntia engelmannii</i>	cactus apple	Occasional
<i>Opuntia ficus-indica</i>	Barbary fig	Occasional
<i>Opuntia fragilis</i>	brittle pricklypear	Occasional
<i>Opuntia littoralis</i>	coastal pricklypear	Occasional
<i>Opuntia oricola</i>	chaparral pricklypear	Occasional
<i>Opuntia phaeacantha</i>	tulip pricklypear	Occasional
<i>Opuntia polyacantha</i>	grizzlybear pricklypear	Occasional
<i>Opuntia polyacantha</i>	hairspine pricklypear	Occasional
<i>Opuntia polyacantha</i>	plains pricklypear	Occasional
<i>Opuntia</i> spp.	(beaver-tail, cholla, pencil cactus, prickly pear, rabbit-ears, tuna)	Occasional
<i>Opuntia tomentosa</i>	woollyjoint pricklypear	Occasional
<i>Oxalis</i>	woodsorrel	Occasional
<i>Oxalis albicans</i>	California woodsorrel	Occasional
<i>Oxalis albicans</i>	radishroot woodsorrel	Occasional
<i>Oxalis bowiei</i>	red-flower woodsorrel	Occasional
<i>Oxalis corniculata</i>	creeping woodsorrel	Occasional
<i>Oxalis hirta</i>	tropical woodsorrel	Occasional
<i>Oxalis incarnata</i>	crimson woodsorrel	Occasional
<i>Oxalis latifolia</i>	broadleaf woodsorrel	Occasional
<i>Oxalis oregana</i>	redwood-sorrel	Occasional
<i>Oxalis pes-caprae</i>	Bermuda buttercup	Occasional
<i>Oxalis purpurea</i>	purple woodsorrel	Occasional
<i>Oxalis radicata</i>	dwarf woodsorrel	Occasional

<i>Oxalis rubra</i>	windowbox woodsorrel	Occasional
<i>Oxalis</i> spp.	(lady's sorrel, redwood sorrel, wood sorrel)	Occasional
<i>Oxalis suksdorfii</i>	Suksdorf woodsorrel	Occasional
<i>Oxalis trillifolia</i>	threeleaf woodsorrel	Occasional
<i>Paeonia</i>	peony	Occasional
<i>Paeonia brownii</i>	Brown's peony	Occasional
<i>Paeonia californica</i>	California peony	Occasional
<i>Paeonia</i> spp.		Occasional
<i>Pandorea jasminoides</i>	Jasmine	
<i>Parahebe</i> spp.		Occasional
<i>Parkinsonia</i>	paloverde	
<i>Parkinsonia aculeata</i>	Jerusalem thorn	
<i>Parkinsonia florida</i>	blue paloverde	
<i>Parkinsonia microphylla</i>	yellow paloverde	
<i>Parkinsonia</i> spp.	(Jerusalem thorn, Mexican palo verde)	
<i>Parthenocissus</i>	creeper	Very Common
<i>Parthenocissus</i> spp.	(woodbine, Virginia creeper)	Very Common
<i>Parthenocissus vitacea</i>	woodbine	Very Common
<i>Passiflora</i>	passionflower	Common
<i>Passiflora caerulea</i>	bluecrown passionflower	Common
<i>Passiflora manicata</i>	red passionflower	Common
<i>Passiflora</i> spp.	Passion Vine	Common
<i>Passiflora tripartita</i>	banana passionflower	Common
<i>Passiflora tripartita</i>	banana poka	Common
<i>Pastinaca</i>	parsnip	Occasional
<i>Pastinaca sativa</i>	wild parsnip	Occasional
<i>Pastinaca</i> spp.	(parsnip)	Occasional
<i>Pelargonium</i>	geranium	Occasional
<i>Pelargonium xdomesticum</i>	regal pelargonium	Occasional
<i>Pelargonium xhortorum</i>	zonal geranium	Occasional
<i>Pelargonium capitatum</i>	rose scented geranium	Occasional
<i>Pelargonium grossularioides</i>	gooseberry geranium	Occasional
<i>Pelargonium inodorum</i>	scentless geranium	Occasional
<i>Pelargonium inquinans</i>	scarlet geranium	Occasional
<i>Pelargonium panduriforme</i>	oakleaf garden geranium	Occasional
<i>Pelargonium peltatum</i>	ivyleaf geranium	Occasional
<i>Pelargonium quercifolium</i>	oakleaf geranium	Occasional
<i>Pelargonium</i> spp.	Geranium	Occasional
<i>Pelargonium vitifolium</i>	grapeleaf geranium	Occasional
<i>Pelargonium zonale</i>	horseshoe geranium	Occasional
<i>Penstemon</i>	beardtongue	Occasional
<i>Penstemon xdubius</i>		Occasional
<i>Penstemon xparishii</i>		Occasional
<i>Penstemon xpeirsonii</i>		Occasional
<i>Penstemon albomarginatus</i>	whitemargin beardtongue	Occasional
<i>Penstemon anguineus</i>	Siskiyou beardtongue	Occasional
<i>Penstemon azureus</i>	azure penstemon	Occasional
<i>Penstemon barbatus</i>	Penstemon	Occasional
<i>Penstemon barnebyi</i>	White River Valley beardtongue	Occasional
<i>Penstemon bicolor</i>	pinto beardtongue	Occasional
<i>Penstemon bicolor</i>	pinto beardtongue	Occasional

<i>Penstemon bryantiae</i>	Bryant's beardtongue	Occasional
<i>Penstemon caesius</i>	San Bernardino beardtongue	Occasional
<i>Penstemon calcareus</i>	limestone beardtongue	Occasional
<i>Penstemon californicus</i>	California penstemon	Occasional
<i>Penstemon centranthifolius</i>	scarlet bugler	Occasional
<i>Penstemon cinicola</i>	ash penstemon	Occasional
<i>Penstemon clevelandii</i>	Cleveland's beardtongue	Occasional
<i>Penstemon clevelandii</i>	San Jacinto beardtongue	Occasional
<i>Penstemon davidsonii</i>	Davidson's penstemon	Occasional
<i>Penstemon deustus</i>	scabland penstemon	Occasional
<i>Penstemon eatonii</i>	firecracker penstemon	Occasional
<i>Penstemon filiformis</i>	threadleaf beardtongue	Occasional
<i>Penstemon floridus</i>	Austin's beardtongue	Occasional
<i>Penstemon floridus</i>	Panamint beardtongue	Occasional
<i>Penstemon fruticiformis</i>	Death Valley beardtongue	Occasional
<i>Penstemon gracilentus</i>	slender penstemon	Occasional
<i>Penstemon grinnellii</i>	Grinnell's beardtongue	Occasional
<i>Penstemon heterodoxus</i>	Shasta beardtongue	Occasional
<i>Penstemon heterodoxus</i>	Sierra beardtongue	Occasional
<i>Penstemon heterophyllus</i>	bunchleaf penstemon	Occasional
<i>Penstemon heterophyllus</i>	foothill beardtongue	Occasional
<i>Penstemon heterophyllus</i>	Purdy's penstemon	Occasional
<i>Penstemon humilis</i>	low beardtongue	Occasional
<i>Penstemon incertus</i>	Mojave beardtongue	Occasional
<i>Penstemon janishiae</i>	Antelope Valley beardtongue	Occasional
<i>Penstemon labrosus</i>	San Gabriel beardtongue	Occasional
<i>Penstemon laetus</i>	mountain blue penstemon	Occasional
<i>Penstemon monoensis</i>	Mono penstemon	Occasional
<i>Penstemon neotericus</i>	Plumas County beardtongue	Occasional
<i>Penstemon newberryi</i>	Berry's penstemon	Occasional
<i>Penstemon newberryi</i>	mountain pride	Occasional
<i>Penstemon newberryi</i>	Sonoma penstemon	Occasional
<i>Penstemon pahutensis</i>	Paiute beardtongue	Occasional
<i>Penstemon palmeri</i>	Palmer's penstemon	Occasional
<i>Penstemon papillatus</i>	Inyo beardtongue	Occasional
<i>Penstemon patens</i>	Lone Pine beardtongue	Occasional
<i>Penstemon personatus</i>	closethroat beardtongue	Occasional
<i>Penstemon procerus</i>	littleflower penstemon	Occasional
<i>Penstemon procerus</i>	pincushion beardtongue	Occasional
<i>Penstemon pseudospectabilis</i>	desert beardtongue	Occasional
<i>Penstemon pseudospectabilis</i>	desert penstemon	Occasional
<i>Penstemon purpusii</i>	Snow Mountain beardtongue	Occasional
<i>Penstemon rattanii</i>	Rattan's beardtongue	Occasional
<i>Penstemon rattanii</i>	Santa Cruz Mountains beardtongue	Occasional
<i>Penstemon roezlii</i>	Roezl's penstemon	Occasional
<i>Penstemon rostriflorus</i>	Bridge penstemon	Occasional
<i>Penstemon rupicola</i>	cliff beardtongue	Occasional
<i>Penstemon rydbergii</i>	herbaceous penstemon	Occasional
<i>Penstemon rydbergii</i>	Rydberg's penstemon	Occasional
<i>Penstemon scapoides</i>	pinyon beardtongue	Occasional
<i>Penstemon speciosus</i>	royal penstemon	Occasional

<i>Penstemon spectabilis</i>	showy penstemon	Occasional
<i>Penstemon</i> spp.	Penstemen	Occasional
<i>Penstemon stephensii</i>	Stephens' penstemon	Occasional
<i>Penstemon strictus</i>	Rocky Mountain penstemon	Occasional
<i>Penstemon subglaber</i>	smooth penstemon	Occasional
<i>Penstemon sudans</i>	Susanville beardtongue	Occasional
<i>Penstemon thompsoniae</i>	Thompson's beardtongue	Occasional
<i>Penstemon thurberi</i>	Thurber's penstemon	Occasional
<i>Penstemon tracyi</i>	Trinity penstemon	Occasional
<i>Penstemon utahensis</i>	Utah penstemon	Occasional
<i>Penstemon venustus</i>	Venus penstemon	Occasional
<i>Perovskia atriplicifolia</i>	Russian Sage	
<i>Persea</i> spp.	(avocado, Florida mahogany, red bay)	Primary
<i>Persoonia</i> spp.	(bonewood, lance-leaf)	Occasional
<i>Petroselinum</i>	parsley	Occasional
<i>Petroselinum crispum</i>	parsley	Occasional
<i>Petroselinum</i> spp.	(parsley)	Occasional
<i>Phaseolus</i>	bean	Common
<i>Phaseolus filiformis</i>	slimjim bean	Common
<i>Phaseolus</i> spp.	(green bean, kidney bean, lima bean, snap bean, stringbean)	Common
<i>Philadelphus</i>	mock orange	Occasional
<i>Philadelphus xinsignis</i>	summer mock orange	Occasional
<i>Philadelphus argenteus</i>	silver mock orange	Occasional
<i>Philadelphus californicus</i>	California mock orange	Occasional
<i>Philadelphus confusus</i>	Piper's mock orange	Occasional
<i>Philadelphus cordifolius</i>	heartleaf mock orange	Occasional
<i>Philadelphus lewisii</i>	Lewis' mock orange	Occasional
<i>Philadelphus microphyllus</i>	littleleaf mock orange	Occasional
<i>Philadelphus oregonus</i>	Oregon mock orange	Occasional
<i>Philadelphus pumilus</i>	dwarf mock orange	Occasional
<i>Philadelphus serpyllifolius</i>	thymeleaf mock orange	Occasional
<i>Philadelphus</i> spp.		Occasional
<i>Philadelphus trichothecus</i>	Columbian mock orange	Occasional
<i>Phlox</i>	phlox	Occasional
<i>Phlox adsurgens</i>	northern phlox	Occasional
<i>Phlox austromontana</i>	mountain phlox	Occasional
<i>Phlox austromontana</i>	prostrate mountain phlox	Occasional
<i>Phlox caespitosa</i>	tufted phlox	Occasional
<i>Phlox condensata</i>		Occasional
<i>Phlox covillei</i>	Coville's phlox	Occasional
<i>Phlox diffusa</i>	spreading phlox	Occasional
<i>Phlox dispersa</i>	High Sierra phlox	Occasional
<i>Phlox dolichantha</i>	Big Bear Valley phlox	Occasional
<i>Phlox douglasii</i>		Occasional
<i>Phlox grayi</i>		Occasional
<i>Phlox hirsuta</i>	Yreka phlox	Occasional
<i>Phlox hoodii</i>	carpet phlox	Occasional
<i>Phlox hoodii</i>	musk phlox	Occasional
<i>Phlox hoodii</i>	spiny phlox	Occasional
<i>Phlox longifolia</i>	longleaf phlox	Occasional

<i>Phlox muscoides</i>		Occasional
<i>Phlox pulvinata</i>	cushion phlox	Occasional
<i>Phlox rigida</i>	stiff phlox	Occasional
<i>Phlox speciosa</i>	showy phlox	Occasional
<i>Phlox</i> spp.	(phlox, sweet William)	Occasional
<i>Phlox stansburyi</i>	cold-desert phlox	Occasional
<i>Phlox superba</i>		Occasional
<i>Phlox viridis</i>	green phlox	Occasional
<i>Phormium</i> spp.		Occasional
<i>Photinia</i>	chokeberry	Very Common
<i>Photinia davidiana</i>	Chinese photinia	Very Common
<i>Photinia</i> spp.	(photinia)	Very Common
<i>Phyllanthus</i> spp.	(emblic, foliage flower, Otaheite gooseberry)	Occasional
<i>Physalis</i>	groundcherry	Occasional
<i>Physalis acutifolia</i>	sharpleaf groundcherry	Occasional
<i>Physalis angulata</i>	cutleaf groundcherry	Occasional
<i>Physalis cinerascens</i>	smallflower groundcherry	Occasional
<i>Physalis cordata</i>	heartleaf groundcherry	Occasional
<i>Physalis crassifolia</i>	yellow nightshade groundcherry	Occasional
<i>Physalis grisea</i>	strawberry-tomato	Occasional
<i>Physalis hederifolia</i>	Fendler's groundcherry	Occasional
<i>Physalis hederifolia</i>	ivyleaf groundcherry	Occasional
<i>Physalis hederifolia</i>	Palmer's groundcherry	Occasional
<i>Physalis longifolia</i>	longleaf groundcherry	Occasional
<i>Physalis mollis</i>	field groundcherry	Occasional
<i>Physalis peruviana</i>	Peruvian groundcherry	Occasional
<i>Physalis philadelphica</i>	Mexican groundcherry	Occasional
<i>Physalis pubescens</i>	husk tomato	Occasional
<i>Physalis pubescens</i>	husk tomato	Occasional
<i>Physalis</i> spp.	(ground cherry, husk tomato, tomatillo)	Occasional
<i>Picea</i>	spruce	Common
<i>Picea breweriana</i>	Brewer spruce	Common
<i>Picea engelmannii</i>	Engelmann spruce	Common
<i>Picea engelmannii</i>	Engelmann spruce	Common
<i>Picea sitchensis</i>	Sitka spruce	Common
<i>Picea</i> spp.	(spruce)	Common
<i>Pieris</i> spp.	(andromeda, fetterbrush, Japanese pieris, lily-of-the-valley bush)	Common
<i>Pinus</i>	pine	Common
<i>Pinus xattenuradiata</i>		Common
<i>Pinus albicaulis</i>	whitebark pine	Common
<i>Pinus attenuata</i>	knobcone pine	Common
<i>Pinus balfouriana</i>	foxtail pine	Common
<i>Pinus contorta</i>	beach pine	Common
<i>Pinus contorta</i>	Bolander beach pine	Common
<i>Pinus contorta</i>	lodgepole pine	Common
<i>Pinus contorta</i>	Sierra lodgepole pine	Common
<i>Pinus coulteri</i>	Coulter pine	Common
<i>Pinus edulis</i>	twoneedle pinyon	Common
<i>Pinus flexilis</i>	limber pine	Common
<i>Pinus halepensis</i>	aleppo pine	Common

<i>Pinus jeffreyi</i>	Jeffrey pine	Common
<i>Pinus lambertiana</i>	sugar pine	Common
<i>Pinus longaeva</i>	Great Basin bristlecone pine	Common
<i>Pinus monophylla</i>	California pine	Common
<i>Pinus monophylla</i>	singleleaf pinyon	Common
<i>Pinus monophylla</i>	singleleaf pinyon	Common
<i>Pinus monticola</i>	western white pine	Common
<i>Pinus muricata</i>	Bishop pine	Common
<i>Pinus pinea</i>	Italian stone pine	Common
<i>Pinus ponderosa</i>	ponderosa pine	Common
<i>Pinus ponderosa</i>	ponderosa pine	Common
<i>Pinus quadrifolia</i>	Parry pinyon	Common
<i>Pinus radiata</i>	Monterey pine	Common
<i>Pinus sabiniana</i>	California foothill pine	Common
<i>Pinus</i> spp.	(pines)	Common
<i>Pinus torreyana</i>	Santa Cruz Island Torrey pine	Common
<i>Pinus torreyana</i>	Torrey pine	Common
<i>Pinus washoensis</i>	Washoe pine	Common
<i>Pipturus</i> spp.	(mamaki)	
<i>Pisum</i>	pea	Very Common
<i>Pisum sativum</i>	garden pea	Very Common
<i>Pisum</i> spp.	(garden pea, English pea, snow pea, sugar pea)	Very Common
<i>Pittosporum</i>	cheesewood	
<i>Pittosporum crassifolium</i>	stiffleaf cheesewood	
<i>Pittosporum</i> spp.	Pittosporum	
<i>Pittosporum tenuifolium</i>	tawhiwhi	
<i>Pittosporum tobira</i>	Japanese cheesewood	
<i>Pittosporum undulatum</i>	Australian cheesewood	
<i>Plantago</i>	plantain	Common
<i>Plantago aristata</i>	largebracted plantain	Common
<i>Plantago bigelovii</i>	coast plantain	Common
<i>Plantago coronopus</i>	buckhorn plantain	Common
<i>Plantago elongata</i>	prairie plantain	Common
<i>Plantago elongata</i>	prairie plantain	Common
<i>Plantago erecta</i>	dotseed plantain	Common
<i>Plantago eriopoda</i>	redwool plantain	Common
<i>Plantago firma</i>	Chilean plantain	Common
<i>Plantago lanceolata</i>	narrowleaf plantain	Common
<i>Plantago major</i>	common plantain	Common
<i>Plantago maritima</i>	California goose tongue	Common
<i>Plantago maritima</i>	goose tongue	Common
<i>Plantago ovata</i>	desert Indianwheat	Common
<i>Plantago patagonica</i>	woolly plantain	Common
<i>Plantago psyllium</i>	sand plantain	Common
<i>Plantago pusilla</i>	dwarf plantain	Common
<i>Plantago rhodosperma</i>	redseed plantain	Common
<i>Plantago</i> spp.	(plantain)	Common
<i>Plantago subnuda</i>	tall coastal plantain	Common
<i>Plantago virginica</i>	Virginia plantain	Common
<i>Platysace</i> spp.	(native parsnip)	Occasional
<i>Plumbago</i>	leadwort	Occasional

<i>Plumbago auriculata</i>	Cape leadwort	Occasional
<i>Plumbago</i> spp.	(leadwort, plumbago)	Occasional
<i>Podranea</i> spp.		
<i>Polygala</i>	polygala	Occasional
<i>Polygala acanthoclada</i>	desert polygala	Occasional
<i>Polygala californica</i>	California milkwort	Occasional
<i>Polygala cornuta</i>	Sierra milkwort	Occasional
<i>Polygala heterorhyncha</i>	beaked spiny polygala	Occasional
<i>Polygala intermontana</i>	Intermountain milkwort	Occasional
<i>Polygala myrtifolia</i>	myrtle-leaf milkwort	Occasional
<i>Polygala</i> spp.	(milkworts)	Occasional
<i>Polygala subspinosa</i>	spiny milkwort	Occasional
<i>Polygonum</i>	knotweed	Common
<i>Polygonum amphibium</i>	longroot smartweed	Common
<i>Polygonum amphibium</i>	water knotweed	Common
<i>Polygonum amphibium</i>	water smartweed	Common
<i>Polygonum arenastrum</i>	oval-leaf knotweed	Common
<i>Polygonum argyrocoleon</i>	silversheath knotweed	Common
<i>Polygonum baldschuanicum</i>	Bukhara fleecflower	Common
<i>Polygonum bellardii</i>	narrowleaf knotweed	Common
<i>Polygonum bidwelliae</i>	Bidwell's knotweed	Common
<i>Polygonum bistortoides</i>	American bistort	Common
<i>Polygonum bolanderi</i>	Bolander's knotweed	Common
<i>Polygonum californicum</i>	California knotweed	Common
<i>Polygonum capitatum</i>	pinkhead smartweed	Common
<i>Polygonum convolvulus</i>	black bindweed	Common
<i>Polygonum cuspidatum</i>	Japanese knotweed	Common
<i>Polygonum davisiae</i>	Davis' knotweed	Common
<i>Polygonum douglasii</i>	Austin knotweed	Common
<i>Polygonum douglasii</i>	Douglas' knotweed	Common
<i>Polygonum douglasii</i>	Douglas' knotweed	Common
<i>Polygonum douglasii</i>	Johnston's knotweed	Common
<i>Polygonum douglasii</i>	large knotweed	Common
<i>Polygonum douglasii</i>	scatter knotweed	Common
<i>Polygonum erectum</i>	erect knotweed	Common
<i>Polygonum fowleri</i>	Fowler's knotweed	Common
<i>Polygonum hickmanii</i>	Hickman's knotweed	Common
<i>Polygonum hydropiper</i>	marshpepper knotweed	Common
<i>Polygonum hydropiperoides</i>	swamp smartweed	Common
<i>Polygonum lapathifolium</i>	curlytop knotweed	Common
<i>Polygonum marinense</i>	Marin knotweed	Common
<i>Polygonum minimum</i>	broadleaf knotweed	Common
<i>Polygonum multiflorum</i>	tuber fleecflower	Common
<i>Polygonum orientale</i>	kiss me over the garden gate	Common
<i>Polygonum paronychia</i>	beach knotweed	Common
<i>Polygonum parryi</i>	Parry's knotweed	Common
<i>Polygonum patulum</i>	Bellard's smartweed	Common
<i>Polygonum pennsylvanicum</i>	Pennsylvania smartweed	Common
<i>Polygonum persicaria</i>	spotted ladysthumb	Common
<i>Polygonum phytolaccifolium</i>	poke knotweed	Common
<i>Polygonum polygaloides</i>	fruitleaf knotweed	Common

<i>Polygonum polygaloides</i>	Kellogg's knotweed	Common
<i>Polygonum polygaloides</i>	milkwort knotweed	Common
<i>Polygonum polygaloides</i>	whitemargin knotweed	Common
<i>Polygonum polystachyum</i>	cultivated knotweed	Common
<i>Polygonum punctatum</i>	dotted smartweed	Common
<i>Polygonum ramosissimum</i>	bushy knotweed	Common
<i>Polygonum ramosissimum</i>	bushy knotweed	Common
<i>Polygonum sachalinense</i>	giant knotweed	Common
<i>Polygonum shastense</i>	Shasta knotweed	Common
<i>Polygonum</i> spp.	(fleece flower, knotweed, smartweed)	Common
<i>Populus</i>	cottonwood	Occasional
<i>Populus xcanadensis</i>	Carolina poplar	Occasional
<i>Populus xinopina</i>		Occasional
<i>Populus xparryi</i>		Occasional
<i>Populus alba</i>	white poplar	Occasional
<i>Populus angustifolia</i>	narrowleaf cottonwood	Occasional
<i>Populus balsamifera</i>	balsam poplar	Occasional
<i>Populus balsamifera</i>	black cottonwood	Occasional
<i>Populus deltoides</i>		Occasional
<i>Populus fremontii</i>	Fremont cottonwood	Occasional
<i>Populus nigra</i>	Lombardy poplar	Occasional
<i>Populus</i> spp.	(cottonwood, poplar)	Occasional
<i>Populus tremuloides</i>	quaking aspen	Occasional
<i>Primula</i>	primrose	Occasional
<i>Primula</i> spp.	(cowslip, primrose, primula)	Occasional
<i>Primula suffrutescens</i>	Sierra primrose	Occasional
<i>Protea</i> spp.	Protea	
<i>Prunus</i>	plum	Very Common
<i>Prunus akebono</i>	Flowering Cherry	Very Common
<i>Prunus andersonii</i>	desert peach	Very Common
<i>Prunus angustifolia</i>	Chickasaw plum	Very Common
<i>Prunus angustifolia</i>	Chickasaw plum	Very Common
<i>Prunus armeniaca</i>	apricot	Very Common
<i>Prunus avium</i>	Cherry	Very Common
<i>Prunus avium</i>	Cherry	Very Common
<i>Prunus caroliniana</i>	Carolina Laurel Cherry	Very Common
<i>Prunus caroliniana</i>	Carolina Laurel Cherry	Very Common
<i>Prunus cerasifera</i>		Very Common
<i>Prunus domestica</i>	Plum	Very Common
<i>Prunus domestica</i>	Plum	Very Common
<i>Prunus dulcis</i>	sweet almond	Very Common
<i>Prunus emarginata</i>	bitter cherry	Very Common
<i>Prunus fasciculata</i>	desert almond	Very Common
<i>Prunus fremontii</i>	desert apricot	Very Common
<i>Prunus ilicifolia</i>	hollyleaf cherry	Very Common
<i>Prunus laurel</i>	Laurel	Very Common
<i>Prunus laurocerasus</i>	cherry laurel	Very Common
<i>Prunus lusitanica</i>	Portugal laurel	Very Common
<i>Prunus lyonii</i>	Catalina Cherry	Very Common
<i>Prunus mahaleb</i>	Mahaleb cherry	Very Common
<i>Prunus persica</i>	peach	Very Common

<i>Prunus serrulata</i>		Very Common
<i>Prunus</i> spp.		Very Common
<i>Prunus</i> spp.	Japanese Weeping Cherry	Very Common
<i>Prunus</i> spp.	Double Weeping Rosebud Cherry	Very Common
<i>Prunus</i> spp.	Pluot	Very Common
<i>Prunus subcordata</i>	Kellogg's Klamath plum	Very Common
<i>Prunus subcordata</i>	Klamath plum	Very Common
<i>Prunus subcordata</i>	Oregon Klamath plum	Very Common
<i>Prunus virginiana</i>	black chokecherry	Very Common
<i>Prunus virginiana</i>	chokecherry	Very Common
<i>Prunus virginiana</i>	western chokecherry	Very Common
<i>Pseudopanax</i> spp.	(five-finger, lancewood)	
<i>Pseudotsuga</i>	Douglas-fir	Common
<i>Pseudotsuga macrocarpa</i>	bigcone Douglas-fir	Common
<i>Pseudotsuga menziesii</i>	Douglas-fir	Common
<i>Pseudotsuga menziesii</i>	Douglas-fir	Common
<i>Pseudotsuga</i> spp.	(big-cone pine, Douglas-fir, Japanese Douglas-fir)	Common
<i>Pseudowintera</i> spp.	(Horpito)	Occasional
<i>Psidium cattleianum</i>	Strawberry Guava	
<i>Pteridium</i>	brackenfern	Common
<i>Pteridium aquilinum</i>	hairy brackenfern	Common
<i>Pteridium aquilinum</i>	western brackenfern	Common
<i>Pteridium</i> spp.	(brackenfern)	Common
<i>Pteris</i>	brake fern	Occasional
<i>Pteris cretica</i>	Cretan brake	Occasional
<i>Pteris felix</i>		Occasional
<i>Pteris multifida</i>	spider brake	Occasional
<i>Pteris</i> spp.	(brake, dish fern, table fern)	Occasional
<i>Pteris tremula</i>	Australian brake	Occasional
<i>Pteris vittata</i>	ladder brake	Occasional
<i>Pulicaria</i>	false fleabane	
<i>Pulicaria paludosa</i>	Spanish false fleabane	
<i>Pulicaria</i> spp.	(false fleabane)	
<i>Pyracantha</i>	firethorn	Very Common
<i>Pyracantha angustifolia</i>	narrowleaf firethorn	Very Common
<i>Pyracantha coccinea</i>	scarlet firethorn	Very Common
<i>Pyracantha crenulata</i>	Nepalese firethorn	Very Common
<i>Pyracantha fortuneana</i>	Chinese firethorn	Very Common
<i>Pyracantha</i> spp.	(fire thorn, pyracantha)	Very Common
<i>Pyrus</i>	pear	Very Common
<i>Pyrus communis</i>	common pear	Very Common
<i>Pyrus</i> spp.	Asian Pear	Very Common
<i>Pyrus</i> spp.	Pear	Very Common
<i>Quercus</i>	oak	Occasional
<i>Quercus xacutidens</i>		Occasional
<i>Quercus xalvordiana</i>	Alvord oak	Occasional
<i>Quercus xepingii</i>		Occasional
<i>Quercus xganderi</i>		Occasional
<i>Quercus xgrandidentata</i>		Occasional
<i>Quercus xhowellii</i>		Occasional

<i>Quercus xjolonensis</i>		Occasional
<i>Quercus xmacdonaldii</i>	MacDonald oak	Occasional
<i>Quercus xmoreha</i>	oracle oak	Occasional
<i>Quercus xmunzii</i>		Occasional
<i>Quercus xsubconvexa</i>		Occasional
<i>Quercus xtownei</i>		Occasional
<i>Quercus agrifolia</i>	California live oak	Occasional
<i>Quercus agrifolia</i>	coastal live oak	Occasional
<i>Quercus berberidifolia</i>	scrub oak	Occasional
<i>Quercus cedrosensis</i>	Cedros Island oak	Occasional
<i>Quercus chrysolepis</i>	canyon live oak	Occasional
<i>Quercus cornelius-mulleri</i>	Muller oak	Occasional
<i>Quercus douglasii</i>	blue oak	Occasional
<i>Quercus dumosa</i>	coastal sage scrub oak	Occasional
<i>Quercus durata</i>	leather oak	Occasional
<i>Quercus engelmannii</i>	Engelmann oak	Occasional
<i>Quercus garryana</i>	Oregon white oak	Occasional
<i>Quercus ilex</i>	holly oak	Occasional
<i>Quercus john-tuckeri</i>	Tucker oak	Occasional
<i>Quercus kelloggii</i>	California black oak	Occasional
<i>Quercus lobata</i>	valley oak	Occasional
<i>Quercus pacifica</i>	Channel Island scrub oak	Occasional
<i>Quercus palmeri</i>	Palmer oak	Occasional
<i>Quercus parvula</i>	coast oak	Occasional
<i>Quercus parvula</i>	Santa Cruz Island oak	Occasional
<i>Quercus parvula</i>	Shreve oak	Occasional
<i>Quercus parvula</i>	Tamalpais oak	Occasional
<i>Quercus sadleriana</i>	deer oak	Occasional
<i>Quercus</i> spp.	(oak)	Occasional
<i>Quercus tomentella</i>	island live oak	Occasional
<i>Quercus turbinella</i>	Sonoran scrub oak	Occasional
<i>Quercus vacciniifolia</i>	huckleberry oak	Occasional
<i>Quercus wislizeni</i>	interior live oak	Occasional
<i>Racosperma</i> spp.	(wattle)	Very Common
<i>Ranunculus</i>	buttercup	Common
<i>Ranunculus acris</i>	showy buttercup	Common
<i>Ranunculus acris</i>	tall buttercup	Common
<i>Ranunculus alismifolius</i>	plantainleaf buttercup	Common
<i>Ranunculus andersonii</i>	Anderson's buttercup	Common
<i>Ranunculus aquatilis</i>	white water crowfoot	Common
<i>Ranunculus arvensis</i>	corn buttercup	Common
<i>Ranunculus bonariensis</i>	Carter's buttercup	Common
<i>Ranunculus bulbosus</i>	St. Anthony's turnip	Common
<i>Ranunculus californicus</i>	California buttercup	Common
<i>Ranunculus canus</i>	Sacramento Valley buttercup	Common
<i>Ranunculus cortusifolius</i>	Azores buttercup	Common
<i>Ranunculus cymbalaria</i>	alkali buttercup	Common
<i>Ranunculus eschscholtzii</i>	Eschscholtz's buttercup	Common
<i>Ranunculus flabellaris</i>	yellow water buttercup	Common
<i>Ranunculus flammula</i>	greater creeping spearwort	Common
<i>Ranunculus flammula</i>	greater creeping spearwort	Common

<i>Ranunculus glaberrimus</i>	elliptical buttercup	Common
<i>Ranunculus glaberrimus</i>	sagebrush buttercup	Common
<i>Ranunculus gormanii</i>	Gorman's buttercup	Common
<i>Ranunculus hebecarpus</i>	delicate buttercup	Common
<i>Ranunculus hydrocharoides</i>	frogbit buttercup	Common
<i>Ranunculus lobbii</i>	Lobb's buttercup	Common
<i>Ranunculus longirostris</i>	longbeak buttercup	Common
<i>Ranunculus macounii</i>	Macoun's buttercup	Common
<i>Ranunculus muricatus</i>	spinyfruit buttercup	Common
<i>Ranunculus occidentalis</i>	western buttercup	Common
<i>Ranunculus orthorhynchus</i>	Bloomer's buttercup	Common
<i>Ranunculus orthorhynchus</i>	straightbeak buttercup	Common
<i>Ranunculus parviflorus</i>	smallflower buttercup	Common
<i>Ranunculus populago</i>	popular buttercup	Common
<i>Ranunculus pusillus</i>	low spearwort	Common
<i>Ranunculus pusillus</i>	low spearwort	Common
<i>Ranunculus repens</i>	creeping buttercup	Common
<i>Ranunculus sardous</i>	hairy buttercup	Common
<i>Ranunculus sceleratus</i>	cursed buttercup	Common
<i>Ranunculus sceleratus</i>	cursed buttercup	Common
<i>Ranunculus</i> spp.	(buttercups, crowfoot)	Common
<i>Ranunculus suksdorfii</i>	Suksdorf's buttercup	Common
<i>Ranunculus trichophyllus</i>	threadleaf crowfoot	Common
<i>Ranunculus trichophyllus</i>	threadleaf crowfoot	Common
<i>Ranunculus uncinatus</i>	Idaho buttercup	Common
<i>Ranunculus uncinatus</i>	woodland buttercup	Common
<i>Ranunculus verecundus</i>	wetslope buttercup	Common
<i>Raphanus</i>	radish	Occasional
<i>Raphanus raphanistrum</i>	wild radish	Occasional
<i>Raphanus sativus</i>	cultivated radish	Occasional
<i>Raphanus</i> spp.	(wild radish)	Occasional
<i>Reseda</i>	mignonette	Occasional
<i>Reseda alba</i>	white upright mignonette	Occasional
<i>Reseda lutea</i>	yellow mignonette	Occasional
<i>Reseda luteola</i>	weld	Occasional
<i>Reseda odorata</i>	garden mignonette	Occasional
<i>Reseda</i> spp.	(mignonette)	Occasional
<i>Rhamnus</i>	buckthorn	
<i>Rhamnus alnifolia</i>	alderleaf buckthorn	
<i>Rhamnus alternus</i>	Italian Buchthorn	
<i>Rhamnus cathartica</i>	common buckthorn	
<i>Rhamnus crocea</i>	hollyleaf buckthorn	
<i>Rhamnus crocea</i>	redberry buckthorn	
<i>Rhamnus ilicifolia</i>	hollyleaf redberry	
<i>Rhamnus pirifolia</i>	island redberry	
<i>Rhamnus</i> spp.	Rhamnus	
<i>Rhaphiolepis</i> spp.	(Japanese-hawthorn)	Very Common
<i>Rhododendron</i>	rhododendron	Common
<i>Rhododendron xcolombianum</i>		Common
<i>Rhododendron macrophyllum</i>	Pacific rhododendron	Common
<i>Rhododendron neoglandulosum</i>		Common

<i>Rhododendron occidentale</i>	Sonoma azalea	Common
<i>Rhododendron occidentale</i>	western azalea	Common
<i>Rhododendron</i> spp.	(azalea, rhododendron)	Common
<i>Ribes</i>	currant	Very Common
<i>Ribes amarum</i>	bitter gooseberry	Very Common
<i>Ribes aureum</i>	golden currant	Very Common
<i>Ribes binominatum</i>	ground gooseberry	Very Common
<i>Ribes bracteosum</i>	stink currant	Very Common
<i>Ribes californicum</i>	hillside gooseberry	Very Common
<i>Ribes canthariforme</i>	Moreno currant	Very Common
<i>Ribes cereum</i>	wax currant	Very Common
<i>Ribes cereum</i>	whisky currant	Very Common
<i>Ribes cruentum</i>	shinyleaf currant	Very Common
<i>Ribes divaricatum</i>	Parish's gooseberry	Very Common
<i>Ribes divaricatum</i>	spreading gooseberry	Very Common
<i>Ribes divaricatum</i>	straggly gooseberry	Very Common
<i>Ribes hudsonianum</i>	northern black currant	Very Common
<i>Ribes hudsonianum</i>	western black currant	Very Common
<i>Ribes indecorum</i>	whiteflower currant	Very Common
<i>Ribes inerme</i>	Klamath gooseberry	Very Common
<i>Ribes inerme</i>	whitestem gooseberry	Very Common
<i>Ribes lacustre</i>	prickly currant	Very Common
<i>Ribes lasianthum</i>	alpine gooseberry	Very Common
<i>Ribes laxiflorum</i>	trailing black currant	Very Common
<i>Ribes lobbii</i>	gummy gooseberry	Very Common
<i>Ribes malvaceum</i>	chaparral currant	Very Common
<i>Ribes marshallii</i>	Hupa gooseberry	Very Common
<i>Ribes menziesii</i>	canyon gooseberry	Very Common
<i>Ribes montigenum</i>	gooseberry currant	Very Common
<i>Ribes nevadense</i>	Jaeger's currant	Very Common
<i>Ribes nevadense</i>	Sierra currant	Very Common
<i>Ribes quercetorum</i>	rock gooseberry	Very Common
<i>Ribes roezlii</i>	Sierra gooseberry	Very Common
<i>Ribes sanguineum</i>		Very Common
<i>Ribes sanguineum</i>		Very Common
<i>Ribes sericeum</i>	Lucia gooseberry	Very Common
<i>Ribes speciosum</i>	fuchsiaflower gooseberry	Very Common
<i>Ribes</i> spp.		Very Common
<i>Ribes thacherianum</i>	Santa Cruz gooseberry	Very Common
<i>Ribes tularensis</i>	Tulare gooseberry	Very Common
<i>Ribes velutinum</i>	desert gooseberry	Very Common
<i>Ribes velutinum</i>	Gooding's gooseberry	Very Common
<i>Ribes viburnifolium</i>	island gooseberry	Very Common
<i>Ribes victoris</i>	Victor's gooseberry	Very Common
<i>Ribes viscosissimum</i>	sticky currant	Very Common
<i>Ripogonum</i> spp.	(supplejack)	Occasional
<i>Robinia</i>	locust	
<i>Robinia hispida</i>	bristly locust	
<i>Robinia neomexicana</i>	New Mexico locust	
<i>Robinia pseudoacacia</i>	black locust	
<i>Robinia</i> spp.	(locust)	

<i>Rosa</i>	rose	Very Common
<i>Rosa ?pinetorum</i>	pine rose	Very Common
<i>Rosa bridgesii</i>	pygmy rose	Very Common
<i>Rosa californica</i>	California wildrose	Very Common
<i>Rosa canina</i>	dog rose	Very Common
<i>Rosa eglantheria</i>	sweetbriar rose	Very Common
<i>Rosa gymnocarpa</i>	dwarf rose	Very Common
<i>Rosa minutifolia</i>	Baja rose	Very Common
<i>Rosa multiflora</i>	multiflora rose	Very Common
<i>Rosa nutkana</i>	Nootka rose	Very Common
<i>Rosa pisocarpa</i>	cluster rose	Very Common
<i>Rosa sicula</i>	Mediterranean rose	Very Common
<i>Rosa spithamea</i>	ground rose	Very Common
<i>Rosa spithamea</i>	Sonoma ground rose	Very Common
<i>Rosa</i> spp.	Rose	Very Common
<i>Rosa woodsii</i>	Tehachapi rose	Very Common
<i>Rosa woodsii</i>	Woods' rose	Very Common
<i>Rosa yainacensis</i>	Cascade rose	Very Common
<i>Rubus</i>	blackberry	Primary
<i>Rubus aboriginum</i>	garden dewberry	Primary
<i>Rubus allegheniensis</i>	Allegheny blackberry	Primary
<i>Rubus armeniacus</i>	Himalayan blackberry	Primary
<i>Rubus glaucifolius</i>	Cuyamaca raspberry	Primary
<i>Rubus glaucifolius</i>	San Diego raspberry	Primary
<i>Rubus idaeus</i>	American red raspberry	Primary
<i>Rubus idaeus</i>	grayleaf red raspberry	Primary
<i>Rubus laciniatus</i>	cutleaf blackberry	Primary
<i>Rubus lasiococcus</i>	roughfruit berry	Primary
<i>Rubus leucodermis</i>	whitebark raspberry	Primary
<i>Rubus nivalis</i>	snow raspberry	Primary
<i>Rubus parviflorus</i>	thimbleberry	Primary
<i>Rubus spectabilis</i>	salmonberry	Primary
<i>Rubus</i> spp.	(blackberry, boysenberry, raspberry)	Primary
<i>Rubus ulmifolius</i>	elmleaf blackberry	Primary
<i>Rubus ursinus</i>	California blackberry	Primary
<i>Rubus vitifolius</i>	Pacific dewberry	Primary
<i>Rudbeckia</i>	coneflower	
<i>Rudbeckia californica</i>	California coneflower	
<i>Rudbeckia glaucescens</i>	waxy coneflower	
<i>Rudbeckia hirta</i>	blackeyed Susan	
<i>Rudbeckia klamathensis</i>	Klamath coneflower	
<i>Rudbeckia occidentalis</i>	western coneflower	
<i>Rumex</i>	dock	Common
<i>Rumex xacutus</i>		Common
<i>Rumex acetosella</i>	common sheep sorrel	Common
<i>Rumex aquaticus</i>	western dock	Common
<i>Rumex conglomeratus</i>	clustered dock	Common
<i>Rumex crispus</i>	curly dock	Common
<i>Rumex dentatus</i>	toothed dock	Common
<i>Rumex frutescens</i>	wedgeleaf dock	Common
<i>Rumex hymenosepalus</i>	canaigre dock	Common

<i>Rumex kernerii</i>	Kerner's dock	Common
<i>Rumex maritimus</i>	golden dock	Common
<i>Rumex obtusifolius</i>	bitter dock	Common
<i>Rumex occidentalis</i>		Common
<i>Rumex orbiculatus</i>	greater water dock	Common
<i>Rumex paucifolius</i>	alpine sheep sorrel	Common
<i>Rumex pulcher</i>	fiddle dock	Common
<i>Rumex salicifolius</i>	lake willow dock	Common
<i>Rumex salicifolius</i>	Mexican dock	Common
<i>Rumex salicifolius</i>	toothed willow dock	Common
<i>Rumex salicifolius</i>	willow dock	Common
<i>Rumex sanguineus</i>	redvein dock	Common
<i>Rumex</i> spp.	(common sheep sorrel, dock, garden sorrel)	Common
<i>Rumex stenophyllus</i>	narrowleaf dock	Common
<i>Rumex venosus</i>	veiny dock	Common
<i>Rumex violascens</i>	violet dock	Common
<i>Salix</i>	willow	Occasional
<i>Salix xehrhartiana</i>		Occasional
<i>Salix xpendulina</i>	Wisconsin weeping willow	Occasional
<i>Salix xrubens</i>	hybrid crack willow	Occasional
<i>Salix xsepulcralis</i>	weeping willow	Occasional
<i>Salix alba</i>	white willow	Occasional
<i>Salix arctica</i>		Occasional
<i>Salix bebbiana</i>	Bebb willow	Occasional
<i>Salix boothii</i>	Booth's willow	Occasional
<i>Salix brachycarpa</i>	shortfruit willow	Occasional
<i>Salix breweri</i>	Brewer's willow	Occasional
<i>Salix delnortensis</i>	Del Norte willow	Occasional
<i>Salix drummondiana</i>	Drummond's willow	Occasional
<i>Salix eastwoodiae</i>	mountain willow	Occasional
<i>Salix eriocephala</i>		Occasional
<i>Salix exigua</i>	narrowleaf willow	Occasional
<i>Salix geyeriana</i>	Geyer willow	Occasional
<i>Salix gooddingii</i>	Goodding's willow	Occasional
<i>Salix hookeriana</i>	dune willow	Occasional
<i>Salix jepsonii</i>	Jepson's willow	Occasional
<i>Salix laevigata</i>	red willow	Occasional
<i>Salix lasiolepis</i>	arroyo willow	Occasional
<i>Salix lasiolepis</i>	Bigelow's willow	Occasional
<i>Salix lemmonii</i>	Lemmon's willow	Occasional
<i>Salix ligulifolia</i>	strapleaf willow	Occasional
<i>Salix lucida</i>	greenleaf willow	Occasional
<i>Salix lucida</i>	Pacific willow	Occasional
<i>Salix lucida</i>	shining willow	Occasional
<i>Salix lutea</i>	yellow willow	Occasional
<i>Salix melanopsis</i>	dusky willow	Occasional
<i>Salix nivalis</i>	snow willow	Occasional
<i>Salix orestera</i>	Sierra willow	Occasional
<i>Salix petrophila</i>	alpine willow	Occasional
<i>Salix planifolia</i>	diamondleaf willow	Occasional
<i>Salix planifolia</i>	diamondleaf willow	Occasional

<i>Salix prolixa</i>	MacKenzie's willow	Occasional
<i>Salix reticulata</i>		Occasional
<i>Salix scouleriana</i>	Scouler's willow	Occasional
<i>Salix sessilifolia</i>	northwest sandbar willow	Occasional
<i>Salix sitchensis</i>	Sitka willow	Occasional
<i>Salix</i> spp.	Willow	Occasional
<i>Salix tracyi</i>	Tracy's willow	Occasional
<i>Salvia</i>	sage	Occasional
<i>Salvia xbernardina</i>		Occasional
<i>Salvia xpalmeri</i>		Occasional
<i>Salvia aethiopsis</i>	Mediterranean sage	Occasional
<i>Salvia apiana</i>	compact white sage	Occasional
<i>Salvia apiana</i>	white sage	Occasional
<i>Salvia brandegeei</i>	Santa Rosa Island sage	Occasional
<i>Salvia carduacea</i>	thistle sage	Occasional
<i>Salvia clevelandii</i>		Occasional
<i>Salvia columbariae</i>	chia	Occasional
<i>Salvia columbariae</i>	Ziegler's sage	Occasional
<i>Salvia dorrii</i>	purple sage	Occasional
<i>Salvia eremostachya</i>	rose sage	Occasional
<i>Salvia funerea</i>	woolly sage	Occasional
<i>Salvia greatae</i>	lavender sage	Occasional
<i>Salvia leucophylla</i>	San Luis purple sage	Occasional
<i>Salvia longistyla</i>	Mexican sage	Occasional
<i>Salvia mellifera</i>	black sage	Occasional
<i>Salvia microphylla</i>	baby sage	Occasional
<i>Salvia mohavensis</i>	Mojave sage	Occasional
<i>Salvia munzii</i>	Munz's sage	Occasional
<i>Salvia officinalis</i>	kitchen sage	Occasional
<i>Salvia pachyphylla</i>	blue sage	Occasional
<i>Salvia reflexa</i>	lanceleaf sage	Occasional
<i>Salvia sonomensis</i>	creeping sage	Occasional
<i>Salvia spathacea</i>	hummingbird sage	Occasional
<i>Salvia</i> spp.	Sage	Occasional
<i>Salvia vaseyi</i>	scallopleaf sage	Occasional
<i>Salvia verbenaca</i>	wild clary	Occasional
<i>Salvia virgata</i>	wand sage	Occasional
<i>Sambucus</i>	elderberry	Occasional
<i>Sambucus cerulea</i>		Occasional
<i>Sambucus nigra</i>	blue elder	Occasional
<i>Sambucus nigra</i>	common elderberry	Occasional
<i>Sambucus nigra</i>	European black elderberry	Occasional
<i>Sambucus racemosa</i>	black elderberry	Occasional
<i>Sambucus racemosa</i>	red elderberry	Occasional
<i>Sambucus</i> spp.	(elderberry)	Occasional
<i>Santalum</i> spp.	(sandalwood)	
<i>Schlumbergera</i> spp.	Zygocatus spp. (Christmas cactus, claw cactus, crab cactus)	
<i>Senecio</i>	ragwort	Common
<i>Senecio aphanactis</i>	chaparral ragwort	Common
<i>Senecio aronicoides</i>	rayless ragwort	Common

<i>Senecio astephanus</i>	San Gabriel ragwort	Common
<i>Senecio blochmaniae</i>	dune ragwort	Common
<i>Senecio californicus</i>	California ragwort	Common
<i>Senecio cineraria</i>	silver ragwort	Common
<i>Senecio clarkianus</i>	Clark's ragwort	Common
<i>Senecio elegans</i>	redpurple ragwort	Common
<i>Senecio flaccidus</i>	Douglas' ragwort	Common
<i>Senecio flaccidus</i>	Mono ragwort	Common
<i>Senecio flaccidus</i>	threadleaf ragwort	Common
<i>Senecio fremontii</i>	dwarf mountain ragwort	Common
<i>Senecio hydrophiloides</i>	tall groundsel	Common
<i>Senecio hydrophilus</i>	water ragwort	Common
<i>Senecio integerrimus</i>	Columbia ragwort	Common
<i>Senecio integerrimus</i>	lambstongue ragwort	Common
<i>Senecio integerrimus</i>	paleyellow ragwort	Common
<i>Senecio jacobaea</i>	stinking willie	Common
<i>Senecio lyonii</i>	island senecio	Common
<i>Senecio mohavensis</i>	Mojave ragwort	Common
<i>Senecio pattersonensis</i>	Patterson's senecio	Common
<i>Senecio scorzonella</i>	Sierra ragwort	Common
<i>Senecio serra</i>	tall ragwort	Common
<i>Senecio spartioides</i>	broomlike ragwort	Common
<i>Senecio</i> spp.	(dusty-miller, groundsels)	Common
<i>Senecio squalidus</i>	oxford ragwort	Common
<i>Senecio sylvaticus</i>	woodland ragwort	Common
<i>Senecio triangularis</i>	arrowleaf ragwort	Common
<i>Senecio vulgaris</i>	old-man-in-the-Spring	Common
<i>Sequoia</i>	redwood	
<i>Sequoia sempervirens</i>	redwood	
<i>Sequoia</i> spp.	(coast redwood)	
<i>Sida</i>	fanpetals	Occasional
<i>Sida abutilifolia</i>	spreading fanpetals	Occasional
<i>Sida rhombifolia</i>	Cuban jute	Occasional
<i>Sida spinosa</i>	prickly fanpetals	Occasional
<i>Sida</i> spp.	(fanpetals, Virginia mallow)	Occasional
<i>Sisymbrium</i>	hedgemustard	Common
<i>Sisymbrium altissimum</i>	tall tumbledustard	Common
<i>Sisymbrium erysimoides</i>	Mediterranean rocket	Common
<i>Sisymbrium irio</i>	London rocket	Common
<i>Sisymbrium loeselii</i>	small tumbleweed mustard	Common
<i>Sisymbrium officinale</i>	hedgemustard	Common
<i>Sisymbrium orientale</i>	Indian hedgemustard	Common
<i>Sisymbrium</i> spp.	(hedge mustard)	Common
<i>Smilax</i>	greenbrier	Occasional
<i>Smilax californica</i>	California greenbrier	Occasional
<i>Smilax jamesii</i>	English Peak greenbrier	Occasional
<i>Smilax</i> spp.	(greenbrier, Jacob's ladder, wild sarsaparilla)	Occasional
<i>Solanum</i>	nightshade	Occasional
<i>Solanum americanum</i>	American black nightshade	Occasional
<i>Solanum aviculare</i>	New Zealand nightshade	Occasional
<i>Solanum cardiophyllum</i>	heartleaf horsenettle	Occasional

<i>Solanum carolinense</i>	Carolina horsenettle	Occasional
<i>Solanum clokeyi</i>	Clokey's nightshade	Occasional
<i>Solanum dimidiatum</i>	western horsenettle	Occasional
<i>Solanum douglasii</i>	greenspot nightshade	Occasional
<i>Solanum dulcamara</i>	climbing nightshade	Occasional
<i>Solanum elaeagnifolium</i>	silverleaf nightshade	Occasional
<i>Solanum furcatum</i>	forked nightshade	Occasional
<i>Solanum gayanum</i>	Chilean nightshade	Occasional
<i>Solanum heterodoxum</i>	melonleaf nightshade	Occasional
<i>Solanum lanceolatum</i>	orangeberry nightshade	Occasional
<i>Solanum lycopersicum</i>	garden tomato	Occasional
<i>Solanum marginatum</i>	purple African nightshade	Occasional
<i>Solanum mauritianum</i>	earleaf nightshade	Occasional
<i>Solanum nigrum</i>	black nightshade	Occasional
<i>Solanum parishii</i>	Parish's nightshade	Occasional
<i>Solanum peruvianum</i>	Peruvian nightshade	Occasional
<i>Solanum physalifolium</i>	hoe nightshade	Occasional
<i>Solanum rostratum</i>	buffalobur nightshade	Occasional
<i>Solanum scabrum</i>	garden-huckleberry	Occasional
<i>Solanum sisymbriifolium</i>	sticky nightshade	Occasional
<i>Solanum</i> spp.	(horse nettles, nightshade, pepino, potato)	Occasional
<i>Solanum tenuilobatum</i>	San Diego nightshade	Occasional
<i>Solanum triflorum</i>	cutleaf nightshade	Occasional
<i>Solanum tuberosum</i>	Irish potato	Occasional
<i>Solanum umbelliferum</i>	bluewitch	Occasional
<i>Solanum umbelliferum</i>	bluewitch nightshade	Occasional
<i>Solanum villosum</i>	hairy nightshade	Occasional
<i>Solanum wallacei</i>	Catalina nightshade	Occasional
<i>Solanum xanti</i>	chaparral nightshade	Occasional
<i>Solanum xanti</i>	Hoffmann's nightshade	Occasional
<i>Solanum xanti</i>	San Luis Obispo nightshade	Occasional
<i>Solidago</i>	goldenrod	Common
<i>Solidago altissima</i>	late goldenrod	Common
<i>Solidago californica</i>	California goldenrod	Common
<i>Solidago canadensis</i>	Canada goldenrod	Common
<i>Solidago canadensis</i>	salebrosa goldenrod	Common
<i>Solidago gigantea</i>	giant goldenrod	Common
<i>Solidago guiradonis</i>	Guirado goldenrod	Common
<i>Solidago lepida</i>		Common
<i>Solidago multiradiata</i>	manyray goldenrod	Common
<i>Solidago multiradiata</i>	Rocky Mountain goldenrod	Common
<i>Solidago simplex</i>	Mt. Albert goldenrod	Common
<i>Solidago spathulata</i>		Common
<i>Solidago spectabilis</i>	Nevada goldenrod	Common
<i>Solidago</i> spp.	(California goldenrod, Canada goldenrod, goldenrod)	Common
<i>Solidago velutina</i>	threenerve goldenrod	Common
<i>Sollya</i>	sollya	
<i>Sollya heterophylla</i>	bluebell creeper	
<i>Sollya</i> spp.	(Australian bluebells, bluebell creeper)	
<i>Sonchus</i>	sowthistle	Common

<i>Sonchus arvensis</i>	field sowthistle	Common
<i>Sonchus asper</i>	spiny sowthistle	Common
<i>Sonchus oleraceus</i>	common sowthistle	Common
<i>Sonchus</i> spp.	(sowthistle)	Common
<i>Sonchus tenerrimus</i>	slender sowthistle	Common
<i>Sophora</i> spp.	(sophora)	
<i>Spergula</i>	spurry	Occasional
<i>Spergula arvensis</i>	corn spurry	Occasional
<i>Spergula</i> spp.	(corn spurry, spurry)	Occasional
<i>Spiraea</i>	spirea	
<i>Spiraea douglasii</i>	rose spirea	
<i>Spiraea splendens</i>	rose meadowsweet	
<i>Spiraea</i> spp.	Spiraea	
<i>Syringa</i> spp.	(lilac)	Occasional
<i>Teucrium</i>	germander	
<i>Teucrium canadense</i>	Canada germander	
<i>Teucrium canadense</i>	western germander	
<i>Teucrium cubense</i>	small coastal germander	
<i>Teucrium fruticans</i>	shrubby germander	
<i>Teucrium glandulosum</i>	common germander	
<i>Teucrium</i> spp.	Germander	
<i>Thuja</i>	red cedar	Occasional
<i>Thuja plicata</i>	western red cedar	Occasional
<i>Thuja</i> spp.	(cedar, giant cedar, Oriental arborvitae, red cedar, white cedar)	Occasional
<i>Tibouchina</i> spp.	(glory bush, lasiandra, pleroma, princess flower)	Occasional
<i>Tibouchina urvilleana</i>	Princess Flower	Occasional
<i>Tithonia</i> spp.	(Mexican sunflower)	Common
<i>Tolmiea</i>	youth on age	
<i>Tolmiea menziesii</i>	Piggy-back Plant	
<i>Tolmiea menziesii</i>	Piggy-back Plant	
<i>Trachelospermum jasminoides</i>	Star Jasmine	
<i>Tradescantia</i>	spiderwort	Occasional
<i>Tradescantia fluminensis</i>	small-leaf spiderwort	Occasional
<i>Tradescantia</i> spp.		Occasional
<i>Tradescantia virginiana</i>	Virginia spiderwort	Occasional
<i>Trifolium</i>	clover	Very Common
<i>Trifolium albopurpureum</i>	rancheria clover	Very Common
<i>Trifolium alexandrinum</i>	Egyptian clover	Very Common
<i>Trifolium amoenum</i>	showy Indian clover	Very Common
<i>Trifolium andersonii</i>	Beatley's clover	Very Common
<i>Trifolium andersonii</i>	fiveleaf clover	Very Common
<i>Trifolium andersonii</i>	Mono clover	Very Common
<i>Trifolium angustifolium</i>	narrowleaf crimson clover	Very Common
<i>Trifolium arvense</i>	rabbitfoot clover	Very Common
<i>Trifolium aureum</i>	golden clover	Very Common
<i>Trifolium barbigerum</i>	Andrews' clover	Very Common
<i>Trifolium barbigerum</i>	bearded clover	Very Common
<i>Trifolium beckwithii</i>	Beckwith's clover	Very Common
<i>Trifolium bifidum</i>	notchleaf clover	Very Common
<i>Trifolium bolanderi</i>	parasol clover	Very Common

<i>Trifolium breweri</i>	forest clover	Very Common
<i>Trifolium buckwestiorum</i>	Santa Cruz clover	Very Common
<i>Trifolium campestre</i>	field clover	Very Common
<i>Trifolium cernuum</i>	nodding clover	Very Common
<i>Trifolium ciliolatum</i>	foothill clover	Very Common
<i>Trifolium cyathiferum</i>	cup clover	Very Common
<i>Trifolium dedeckerae</i>	Dedecker's clover	Very Common
<i>Trifolium depauperatum</i>	balloon sack clover	Very Common
<i>Trifolium depauperatum</i>	cowbag clover	Very Common
<i>Trifolium dichotomum</i>	branched Indian clover	Very Common
<i>Trifolium dubium</i>	suckling clover	Very Common
<i>Trifolium eriocephalum</i>	Cusick's clover	Very Common
<i>Trifolium eriocephalum</i>	woollyhead clover	Very Common
<i>Trifolium fragiferum</i>	strawberry clover	Very Common
<i>Trifolium fucatum</i>	bull clover	Very Common
<i>Trifolium gemellum</i>	Spanish clover	Very Common
<i>Trifolium glomeratum</i>	clustered clover	Very Common
<i>Trifolium gracilentum</i>	Palmer's clover	Very Common
<i>Trifolium gracilentum</i>	pinpoint clover	Very Common
<i>Trifolium gymnocarpon</i>	hollyleaf clover	Very Common
<i>Trifolium gymnocarpon</i>	Plummer's clover	Very Common
<i>Trifolium hirtum</i>	rose clover	Very Common
<i>Trifolium howellii</i>	canyon clover	Very Common
<i>Trifolium hybridum</i>	alsike clover	Very Common
<i>Trifolium incarnatum</i>	crimson clover	Very Common
<i>Trifolium jokerstii</i>	Jim's clover	Very Common
<i>Trifolium kingii</i>		Very Common
<i>Trifolium lemmonii</i>	Lemmon's clover	Very Common
<i>Trifolium longipes</i>	Elmer's clover	Very Common
<i>Trifolium longipes</i>	Hansen's clover	Very Common
<i>Trifolium longipes</i>	longstalk clover	Very Common
<i>Trifolium longipes</i>	Oregon clover	Very Common
<i>Trifolium macilentum</i>		Very Common
<i>Trifolium macraei</i>	Chilean clover	Very Common
<i>Trifolium macrocephalum</i>	largehead clover	Very Common
<i>Trifolium microcephalum</i>	smallhead clover	Very Common
<i>Trifolium microdon</i>	thimble clover	Very Common
<i>Trifolium minutissimum</i>	dwarf clover	Very Common
<i>Trifolium monanthum</i>	mountain carpet clover	Very Common
<i>Trifolium mucronatum</i>		Very Common
<i>Trifolium obtusiflorum</i>	clammy clover	Very Common
<i>Trifolium oliganthum</i>	fewflower clover	Very Common
<i>Trifolium olivaceum</i>	olive clover	Very Common
<i>Trifolium polyodon</i>		Very Common
<i>Trifolium pratense</i>	red clover	Very Common
<i>Trifolium productum</i>	Shasta clover	Very Common
<i>Trifolium repens</i>	white clover	Very Common
<i>Trifolium resupinatum</i>	reversed clover	Very Common
<i>Trifolium retusum</i>	teasel clover	Very Common
<i>Trifolium siskiyouense</i>	Siskiyou clover	Very Common
<i>Trifolium spp.</i>	(clover)	Very Common

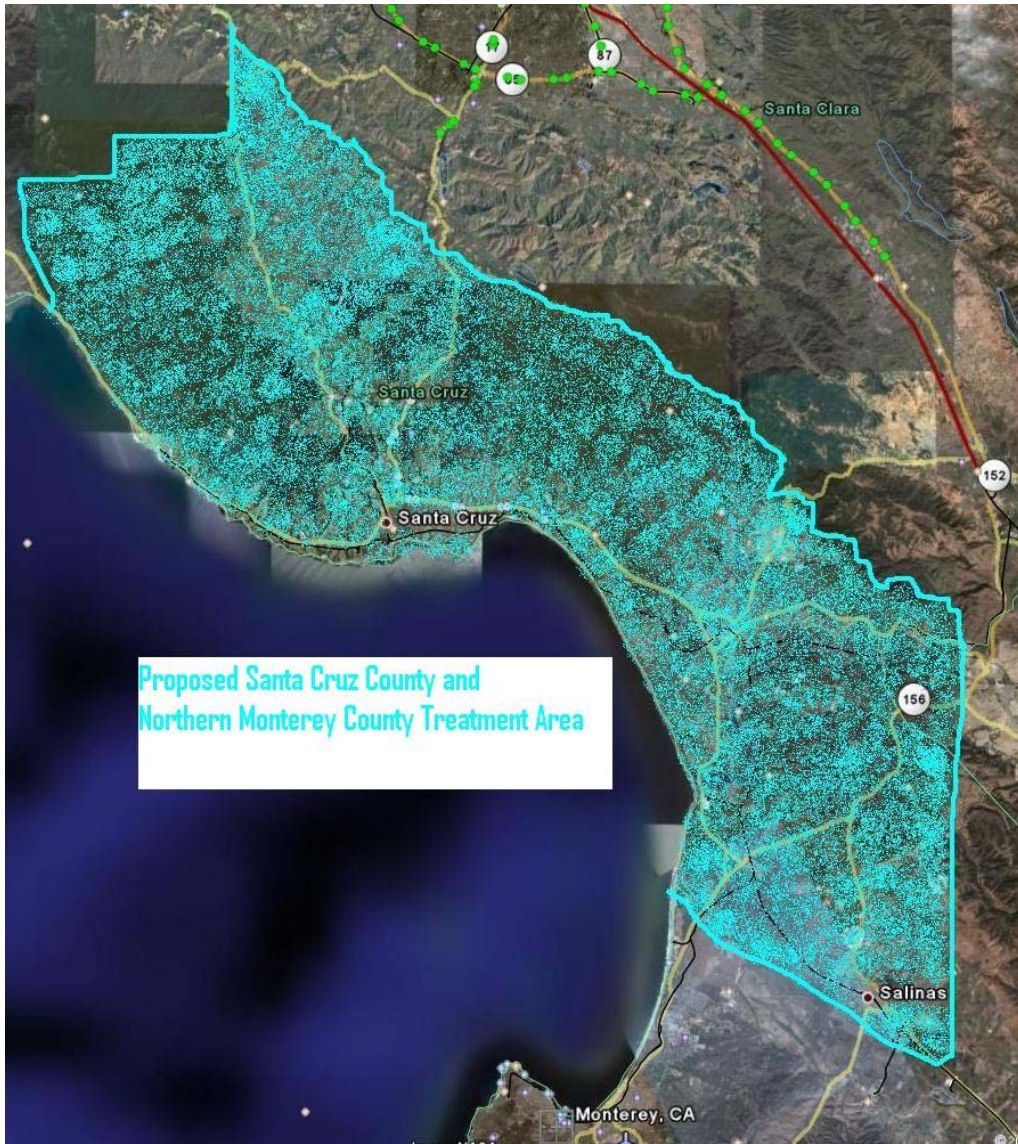
<i>Trifolium stellatum</i>	star clover	Very Common
<i>Trifolium striatum</i>	knotted clover	Very Common
<i>Trifolium subterraneum</i>	subterranean clover	Very Common
<i>Trifolium tomentosum</i>	woolly clover	Very Common
<i>Trifolium trichocalyx</i>	Monterey clover	Very Common
<i>Trifolium variegatum</i>	whitetip clover	Very Common
<i>Trifolium vesiculosum</i>	arrowleaf clover	Very Common
<i>Trifolium willdenovii</i>		Very Common
<i>Trifolium willdenowii</i>	tomcat clover	Very Common
<i>Trifolium wormskioldii</i>	cows clover	Very Common
<i>Triglochin</i>	arrowgrass	Occasional
<i>Triglochin concinna</i>	slender arrowgrass	Occasional
<i>Triglochin maritima</i>	seaside arrowgrass	Occasional
<i>Triglochin palustris</i>	marsh arrowgrass	Occasional
<i>Triglochin</i> spp.	(arrow grass)	Occasional
<i>Triglochin striata</i>	three-rib arrowgrass	Occasional
<i>Ulex</i>	gorse	Very Common
<i>Ulex europaeus</i>	common gorse	Very Common
<i>Ulex</i> spp.	(furze, gorse, whin)	Very Common
<i>Ulma</i> spp.		
<i>Umbellularia</i>	California laurel	
<i>Umbellularia californica</i>	California Bay Laurel	
<i>Umbellularia californica</i>	California Bay Laurel	
<i>Urtica</i>	nettle	Common
<i>Urtica dioica</i>	California nettle	Common
<i>Urtica dioica</i>	stinging nettle	Common
<i>Urtica</i> spp.	(nettles, stinging nettles)	Common
<i>Urtica urens</i>	dwarf nettle	Common
<i>Vaccinium</i>	blueberry	Common
<i>Vaccinium caespitosum</i>	dwarf bilberry	Common
<i>Vaccinium cespitosum</i>		Common
<i>Vaccinium deliciosum</i>	Cascade bilberry	Common
<i>Vaccinium macrocarpon</i>	cranberry	Common
<i>Vaccinium membranaceum</i>	thinleaf huckleberry	Common
<i>Vaccinium ovatum</i>	California huckleberry	Common
<i>Vaccinium parvifolium</i>	red huckleberry	Common
<i>Vaccinium scoparium</i>	grouse whortleberry	Common
<i>Vaccinium</i> spp.	(blueberry)	Common
<i>Vaccinium uliginosum</i>	bog blueberry	Common
<i>Verbena</i>	vervain	Occasional
<i>Verbena xclimensiorum</i>	Amador County vervain	Occasional
<i>Verbena abramsii</i>	San Bernardino vervain	Occasional
<i>Verbena bonariensis</i>	purpletop vervain	Occasional
<i>Verbena bracteata</i>	bigbract verbena	Occasional
<i>Verbena brasiliensis</i>	Brazilian vervain	Occasional
<i>Verbena californica</i>	Red Hills vervain	Occasional
<i>Verbena canescens</i>	gray vervain	Occasional
<i>Verbena hastata</i>	swamp verbena	Occasional
<i>Verbena lasiostachys</i>	western vervain	Occasional
<i>Verbena litoralis</i>	seashore vervain	Occasional
<i>Verbena menthifolia</i>	mint vervain	Occasional

<i>Verbena neomexicana</i>	hillside vervain	Occasional
<i>Verbena officinalis</i>	herb of the cross	Occasional
<i>Verbena rigida</i>	tuberous vervain	Occasional
<i>Verbena robusta</i>		Occasional
<i>Verbena scabra</i>	sandpaper vervain	Occasional
<i>Verbena</i> spp.	(verbena, vervain)	Occasional
<i>Veronica</i>	speedwell	Occasional
<i>Veronica americana</i>	American speedwell	Occasional
<i>Veronica anagallis-aquatica</i>	water speedwell	Occasional
<i>Veronica arvensis</i>	corn speedwell	Occasional
<i>Veronica beccabunga</i>	European speedwell	Occasional
<i>Veronica catenata</i>		Occasional
<i>Veronica chamaedrys</i>	germander speedwell	Occasional
<i>Veronica copelandii</i>	Copeland's speedwell	Occasional
<i>Veronica cusickii</i>	Cusick's speedwell	Occasional
<i>Veronica filiformis</i>	threadstalk speedwell	Occasional
<i>Veronica hederifolia</i>	ivyleaf speedwell	Occasional
<i>Veronica officinalis</i>	common gypsyweed	Occasional
<i>Veronica peregrina</i>	hairy purslane speedwell	Occasional
<i>Veronica peregrina</i>	neckweed	Occasional
<i>Veronica persica</i>	birdeye speedwell	Occasional
<i>Veronica scutellata</i>	skullcap speedwell	Occasional
<i>Veronica serpyllifolia</i>	brightblue speedwell	Occasional
<i>Veronica serpyllifolia</i>	thymeleaf speedwell	Occasional
<i>Veronica</i> spp.	(brooklime, speedwell)	Occasional
<i>Veronica triphyllos</i>	finger speedwell	Occasional
<i>Veronica wormskjoldii</i>	American alpine speedwell	Occasional
<i>Veronica wormskjoldii</i>	American alpine speedwell	Occasional
<i>Viburnum</i>	viburnum	Occasional
<i>Viburnum ellipticum</i>	common viburnum	Occasional
<i>Viburnum</i> spp.	(arrowwoods)	Occasional
<i>Viburnum tinus</i>	Viburnum	Occasional
<i>Viburnum tinus</i>	Viburnum	Occasional
<i>Vicia</i>	vetch	Primary
<i>Vicia ?disperma</i>	European vetch	Primary
<i>Vicia americana</i>	American vetch	Primary
<i>Vicia americana</i>	American vetch	Primary
<i>Vicia articulata</i>	oneflower vetch	Primary
<i>Vicia benghalensis</i>	reddish tufted vetch	Primary
<i>Vicia bithynica</i>	Bithynian vetch	Primary
<i>Vicia cracca</i>	bird vetch	Primary
<i>Vicia faba</i>	horsebean	Primary
<i>Vicia hassei</i>	Hasse's vetch	Primary
<i>Vicia hirsuta</i>	tiny vetch	Primary
<i>Vicia lathyroides</i>	spring vetch	Primary
<i>Vicia ludoviciana</i>	Louisiana vetch	Primary
<i>Vicia lutea</i>	smooth yellow vetch	Primary
<i>Vicia nigricans</i>	black vetch	Primary
<i>Vicia nigricans</i>	giant vetch	Primary
<i>Vicia pannonica</i>	Hungarian vetch	Primary
<i>Vicia sativa</i>	garden vetch	Primary

<i>Vicia</i> spp.	(broad bean, tare, vetch)	Primary
<i>Vicia tetrasperma</i>	lentil vetch	Primary
<i>Vicia villosa</i>	winter vetch	Primary
<i>Vinca</i>	periwinkle	Occasional
<i>Vinca major</i>	bigleaf periwinkle	Occasional
<i>Vinca minor</i>	Vinca	Occasional
<i>Vinca</i> spp.	(periwinkles)	Occasional
<i>Viola</i>	violet	Occasional
<i>Viola adunca</i>	hookedspur violet	Occasional
<i>Viola adunca</i>	hookedspur violet	Occasional
<i>Viola adunca</i>	Kirk's violet	Occasional
<i>Viola arvensis</i>	European field pansy	Occasional
<i>Viola aurea</i>	golden violet	Occasional
<i>Viola bakeri</i>	Baker's violet	Occasional
<i>Viola beckwithii</i>	Beckwith's violet	Occasional
<i>Viola beckwithii</i>	western pansy	Occasional
<i>Viola californica</i>	California violet	Occasional
<i>Viola canadensis</i>		Occasional
<i>Viola cuneata</i>	wedgeleaf violet	Occasional
<i>Viola douglasii</i>	Douglas' golden violet	Occasional
<i>Viola epipsila</i>	dwarf marsh violet	Occasional
<i>Viola epipsila</i>	dwarf marsh violet	Occasional
<i>Viola glabella</i>	pioneer violet	Occasional
<i>Viola hallii</i>	Oregon violet	Occasional
<i>Viola howellii</i>		Occasional
<i>Viola lanceolata</i>	bog white violet	Occasional
<i>Viola lanceolata</i>	bog white violet	Occasional
<i>Viola langsdorfii</i>	Aleutian violet	Occasional
<i>Viola lobata</i>	pine violet	Occasional
<i>Viola macloskeyi</i>	small white violet	Occasional
<i>Viola macloskeyi</i>	smooth white violet	Occasional
<i>Viola nephrophylla</i>	northern bog violet	Occasional
<i>Viola ocellata</i>	pinto violet	Occasional
<i>Viola odorata</i>	sweet violet	Occasional
<i>Viola palustris</i>	marsh violet	Occasional
<i>Viola palustris</i>	marsh violet	Occasional
<i>Viola pedunculata</i>	Johnny-jump-up	Occasional
<i>Viola pinetorum</i>	goosefoot yellow violet	Occasional
<i>Viola praemorsa</i>	canary violet	Occasional
<i>Viola praemorsa</i>	upland yellow violet	Occasional
<i>Viola psychodes</i>	butterfly violet	Occasional
<i>Viola purpurea</i>	goosefoot violet	Occasional
<i>Viola sempervirens</i>	evergreen violet	Occasional
<i>Viola sheltonii</i>	Shelton's violet	Occasional
<i>Viola sororia</i>		Occasional
<i>Viola</i> spp.		Occasional
<i>Viola tomentosa</i>	fettleaf violet	Occasional
<i>Viola tricolor</i>	johnny jumpup	Occasional
<i>Viola vallicola</i>	sagebrush violet	Occasional
<i>Viola vallicola</i>	valley violet	Occasional
<i>Vitis</i>	grape	Very Common

<i>Vitis aestivalis</i>	summer grape	Very Common
<i>Vitis aestivalis</i>	summer grape	Very Common
<i>Vitis californica</i>	California wild grape	Very Common
<i>Vitis girdiana</i>	desert wild grape	Very Common
<i>Vitis rupestris</i>	sand grape	Very Common
<i>Vitis</i> spp.	(grape)	Very Common
<i>Vitis vinifera</i>	wine grape	Very Common
<i>Weigela</i> spp.	(weigela)	Occasional
<i>Weinmannia</i> spp.	(kamahi)	
<i>Wikstroemia</i> spp.	(Mou'a, Oahu false Ohelo)	Common
<i>Wilkesia</i> spp.		
<i>Wisteria</i> spp.	(wisteria)	Very Common
<i>Zea</i>	corn	Occasional
<i>Zea mays</i>	corn	Occasional
<i>Zea</i> spp.	(corn, maize)	Occasional
<i>Zelkova serrata</i>	Zelkova	
<i>Zelkova</i> spp.	(zelkova)	
<i>Zygocactus</i> spp.		Occasional

Appendix B. Proposed Treatment Area





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Appendix C. Ecological Risk Assessment

Screening Level Ecological Risk Assessment for Acetate Based Straight Chain Lepidopteran Pheromones

Introduction

The purpose of this risk assessment is to quantify the risks of straight chain lepidopteran pheromones to nontarget terrestrial and aquatic organisms. Several groups of lepidopteran pheromones have been identified, but the focus of this assessment is to determine potential ecological risks of acetate-based lepidopteran pheromones. This is the class of pheromones that are the active ingredients in both Checkmate labels that are proposed for use in the light brown apple moth (LBAM) eradication program. Current registration data requirements for straight chain lepidopteran pheromones in the United States, Canada, and Europe are less than conventional insecticides (OECD, 2002; EPA, 2007). The reduced data requirements are based on similarities in toxicity, exposure, and environmental fate that suggest that these types of pheromones pose minimal risk to human health and the environment. Due to these similarities in fate and effects, regulatory agencies have adopted a structure activity relationship approach for straight chain lepidopteran pheromones (Weatherston and Minks, 1995). This assessment summarizes the range of toxicity data for acetate-based straight chain lepidopteran pheromones. It also provides conservative estimates of exposure in terrestrial and aquatic environments so that conservative estimates of risk can be determined and discussed.

Toxicity

Terrestrial

Based on the available acute mammalian toxicity data for approximately 10 different lepidopteran pheromones the median lethal oral dose (LD₅₀) for rats would be considered practically nontoxic, with values ranging from greater than 5 g/kg to greater than 34.6 g/kg. Acute dermal toxicity is also considered low with LD₅₀ values ranging from greater than 2 g/kg to 20.25 g/kg, based on study results from nine acetate based straight chain lepidopteran pheromones. Inhalation hazards are also low based on results compiled from three studies that show that the median lethal concentration (LC₅₀) values range from 3.3 to 33.2 mg/L (Touhey, 1990; Inscoc and Ridgway, 1992; Weatherston and Stewart, 2002).

Available subchronic and developmental mammalian toxicity studies have shown no mutagenic or developmental effects for all tested pheromones (Touhey, 1990). Daughtrey et al. (1990) dosed rats daily 5 days per week for 13 weeks with tridecyl acetate at doses ranging from 0.1 to 1.0 g/kg/day. The calculated no observable effect level was found to be 0.1 g/kg/day based on a slight increase in liver weight which is consistent with long-term dosing.

Toxicity to birds is also considered to be very low based on available avian toxicity data. Acute oral LD₅₀ values for bobwhite quail are greater than 2 g/kg while mallard values range from greater than 2 g/kg to greater than 10 g/kg (Weatherston, 2002).

Aquatic

Based on the available acute toxicity data for freshwater fish straight chain lepidopteran pheromones would be considered practically nontoxic. Based on results from four bluegill studies and three rainbow trout studies, the range of toxicity values is greater than 100 mg/L to 540 mg/L for the bluegill sunfish, and greater than 100 mg/L to 270 mg/L for the rainbow trout (Weatherston and Minks, 2002). Aquatic invertebrates appear to be more sensitive than fish with EC₅₀ values ranging from 1.30 to 6.80 mg/L for the freshwater cladoceran, *Daphnia magna*. All aquatic toxicity values that have been reported are above the solubility limits for these types of pheromones in water and would not occur in the environment due to their chemical properties.

Exposure

Due to the unique method of application being implemented in this program, currently available drift models, such as AgDrift and AgDisp, have limited use. Proposed application heights are 2well above the 150-foot application height limit that has been validated using these types of models. To determine exposure of nontarget organisms to pheromone applications, residues in terrestrial and aquatic systems were calculated based on the assumption of direct applications to both environments.

Terrestrial

Residues in terrestrial environments were determined using the Environmental Protection Agency's (EPA) Office of Pesticide Program (OPP) Terrestrial Residue Exposure Model (T-REX) (EPA, 2005). T-REX allows the user to input variables such as use, application rate/type, percent active ingredient, foliar dissipation half-life, application interval and number of applications to calculate exposure concentrations on a variety of food items. All estimated environmental concentrations (EEC) in this risk assessment are based on the upper bound residue estimates on different terrestrial food items. Output from the model has been validated based on the review of field residue data (Fletcher et al., 1994). Dose based residues were calculated for different sized mammals and birds so that they could be compared to the most sensitive toxicity value for each group (table 1 and 2). Residues are assumed to result from a direct application to the listed food items.

Table 1. Expected Pheromone Residues For Different Mammalian Classes and Body Weights.

Dose-Based EECs (mg/kg-bw [*])	Mammalian Classes and Body Weight					
	Herbivores/ insectivores			Granivores		
	15 g	35 g	1000 g	15 g	35 g	1000 g
Short Grass	10.07	6.96	1.61			
Tall Grass	4.61	3.19	0.74			
Broadleaf plants/sm Insects	5.66	3.91	0.91			
Fruits/pods/seeds/lg insects	0.63	0.43	0.10	0.14	0.10	0.02

^{*}bw = body weight

Table 2. Expected Pheromone Residues For Different Avian Classes and Body Weights.

Dose-based EECs (mg/kg-bw)	Avian Classes and Body Weights		
	small	mid	large
	20 g	100 g	1000 g
Short Grass	12.03	6.86	3.07
Tall Grass	5.51	3.14	1.41
Broadleaf plants/sm Insects	6.77	3.86	1.73
Fruits/pods/seeds/lg insects	0.75	0.43	0.19

Aquatic

As a more conservative estimate of exposure, residues in aquatic environments were determined based on the assumption of a direct application. This would not occur in an actual application because it is inconsistent with the label for both products and would be a violation of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). In addition, the pheromone is insoluble in water and would not be able to go into solution resulting in exposure to aquatic fauna. The assumptions in the direct application were that a maximum rate of pheromone (20 g/active ingredient/acre) would be applied directly to a body of water one hectare in size and 0.5 meters deep. The water body was assumed to be a closed system with no inlet or outlet and no degradation of the pheromone. In addition, the pheromone was considered to be 100% soluble in water. Based on these very conservative assumptions, the maximum residue in the defined aquatic system was determined to be 0.01 mg/L.

Risk

The risk to terrestrial and aquatic organisms was quantified by dividing the exposure residue by the most sensitive toxicity value in each environment to determine a risk quotient.

Risk Quotient = Estimated Environmental Concentration / Toxicity Endpoint

EPA OPP uses a similar approach in calculating risk and then compares the risk quotient to levels of concern that have been established to determine a presumption of risk to terrestrial and aquatic nontarget organisms. Levels of concern that have been established for direct acute effects to terrestrial organisms range from 0.1 for endangered species to 0.5, as a trigger, for acute high risk. For aquatic species, the levels of concern range from 0.05 for listed species to 0.5 for aquatic high risk. Risk quotient values that exceed these values result in a presumption of risk and further analysis is needed. Chronic levels of concern are set at one for both terrestrial and aquatic organisms.

Terrestrial

Based on the calculated residues for different mammal classes and the lowest acute toxicity value for mammals ($LD_{50} > 5$ g/kg), all risk quotients were less than 0.009 suggesting minimal risk to nontarget mammals. Using the lowest subchronic toxicity endpoint (NOEL = 0.1 g/kg), chronic risk to different mammal classes was 0.05 and below for all mammal classes and sizes suggesting minimal chronic risk.

Using the residues calculated for different bird classes and sizes, and the lowest reported avian toxicity value ($LD_{50} > 2$ g/kg), all acute risk quotient values were less than 0.01 since the toxicity value was based on a value where no effect was observed at the highest concentration tested.

All calculated risk quotient values for terrestrial nontarget organisms were well below any levels of concern that have been established for terrestrial nontarget organisms by EPA.

Aquatic

The risk to fish was calculated by taking the residue value of 0.01 mg/L and dividing it by the lowest reported LC_{50} , which is reported as greater than 100 mg/L. In this case, the resulting risk quotient value is < 0.0001 since the toxicity value is reported as greater than the highest test concentration. Taking the lowest reported *D. magna* value ($EC_{50} = 1.30$ mg/L) and comparing it to the 0.01 mg/L maximum residue results in a risk quotient value of 0.008. These values show that the residues in water are 130 to greater than 10,000 times below any available aquatic effects data, based on overly conservative estimates of exposure. In addition, the calculated risk quotients are an order of magnitude or more below the most sensitive levels on concern defined by EPA. Risks are actually much lower because the residue calculations assumed a direct application and the pheromone is soluble in water, both of which are not representative of the use pattern or chemical characteristics of the pheromone.

Summary

As with any risk assessment, there is uncertainty due to the limited amount of available toxicity data. In aquatic systems, this uncertainty is addressed to a great extent based on the physical properties of the pheromone in aquatic systems which restricts exposure to water column and benthic organisms. In addition, any pheromone that may reach water volatilizes rapidly and degrades when exposed to oxidation and UV light.

Degradation of the pheromone in terrestrial environments is also rapid with half-lives ranging from a few hours to slightly greater than one day.

Uncertainty exists in the calculated residues in terrestrial environments where they do not account for all food types that can be consumed by various mammals and birds. The values represent levels for mammals and birds that have high consumption rates relative to their body size and would, therefore, potentially consume proportionally larger amounts of pheromone. The higher proportional consumption rates and the assumption that all consumed food items are contaminated with upper-bound estimates of residues provides a conservative estimate of risk.

Uncertainty regarding the toxicity of the active ingredient (which is what the standard toxicity studies are based on) versus the toxicity of the formulation is also reduced since greater than 95% of the inert material is deionized water. The remaining 4 to 5% of the inerts are materials that occur at very low concentrations and are not considered to be of toxicological significance due to low exposure and/or toxicity.

Risks are actually much lower than the calculated values above since the residue calculations assumed a direct application and the pheromone is soluble in water, both of which are not

representative of the use pattern or chemical characteristics of the pheromone. Based on the available toxicity and environmental fate data, and extremely conservative exposure assumptions, the risk to terrestrial and aquatic nontarget organisms is expected to be negligible from applications of acetate-based straight chain lepidopteran pheromones.

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