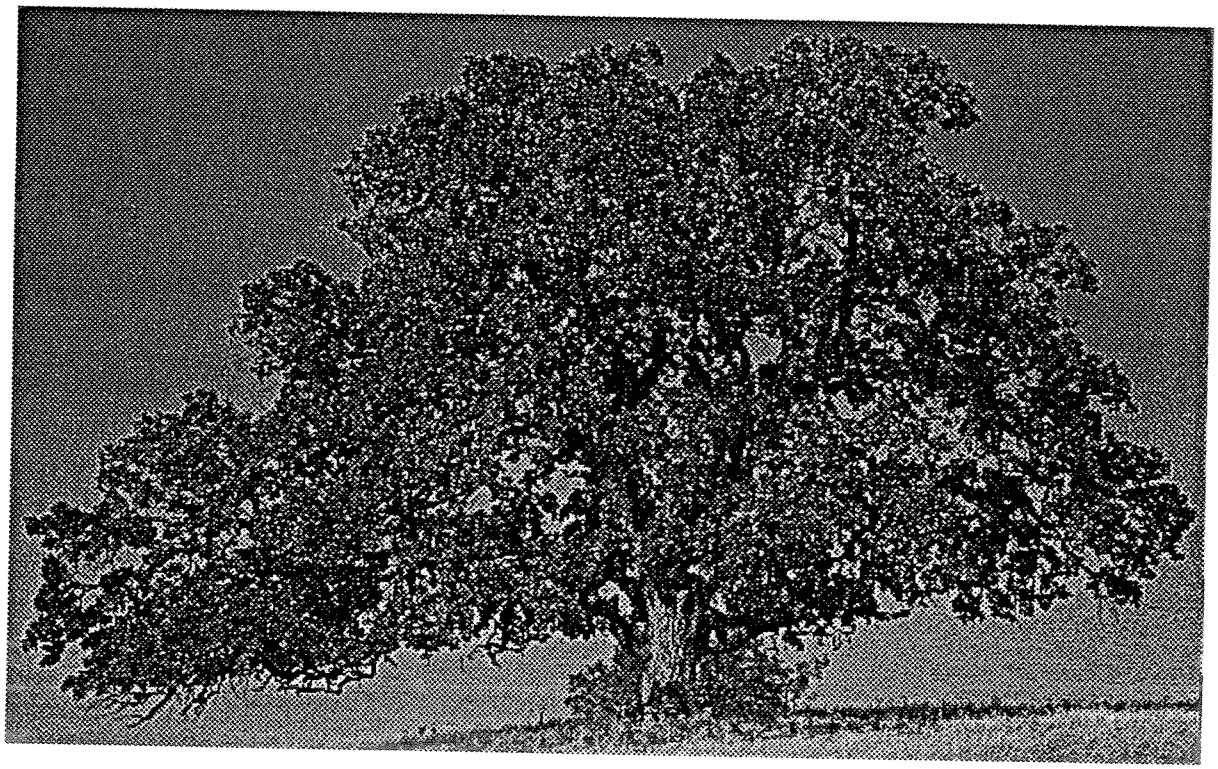
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Natural and Cultural Resources in the Briones Bioregion of Contra Costa County, California



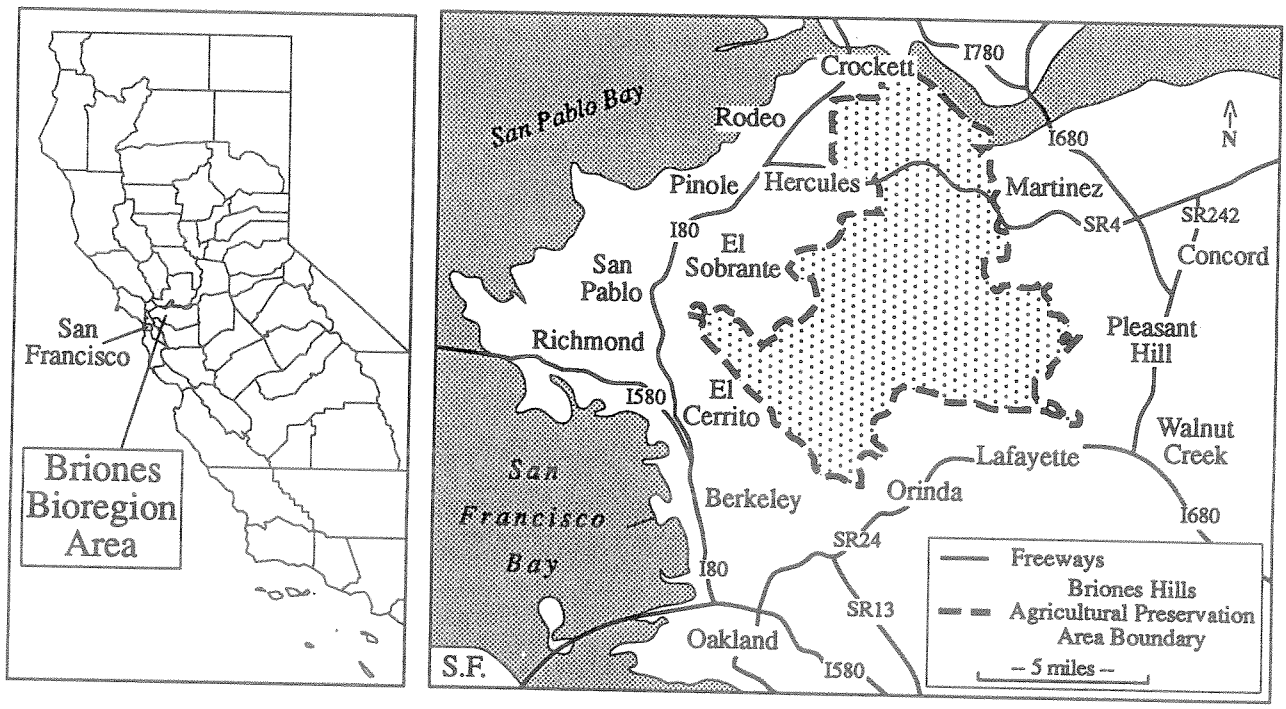
Martinez Regional Land Trust
Martinez, California

Natural and Cultural Resources in the Briones Bioregion of Contra Costa County, California

February, 1992

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Briones Bioregion Vicinity and Detail Maps

Cover photo of Valley Oak at John Muir National Historic Site by Kevin W. Shaw, Fall 1990

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Preface

Efforts to save endangered species and to protect critical habitats have been marginal at best and completely ineffective at worst. Often biologists in particular and conservationists in general have focused on single species protection largely because it is the major legal avenue provided by current regulatory statutes at the federal and state levels. This has been unfortunate because the number of biological species which are being lost in California alone is staggering. Clearly, a new approach is necessary.

The Martinez Regional Land Trust is in the process of developing a citizen-participation approach to resource protection. This report is the first step in this effort. There are several significant elements in the long term commitment the Trust has undertaken which differ from previous efforts: protection of biological diversity within habitats and communities, and establishment of a bioregional context for resource evaluation, protection and management. Clearly, the Trust recognizes the importance of individual species preservation. However, it does so more from an understanding of how little we know about biological communities and the keystone species which are instrumental in holding them together, than it does from a strictly preservationist point of view. This report, then, addresses the implications of understanding the works of our own species within these communities and the broader regional context. We humans are an important element in the biodiversity equation as are the bacteria, worms, insects, salamanders, birds and mammals. How can we express this recognition, and what do we do to ensure the sustainability of the living systems upon which we *all* depend?

As a culture we have all but lost, or failed to acquire the knowledge of the forces of nature and the understanding of what it takes for humans to survive. This is one of the goals of the report: how can we improve our knowledge of local ecosystems and better equip our children for the future? This document presents a process which will provide data necessary for understanding biological diversity in the Briones Bioregion and at the same time provide an educational experience which would be useful and engaging for school children as well as adults.

This document may serve as a model for citizen initiated, non-governmental approaches to resource analysis and protection. The Martinez Regional Land Trust will use the data and promote the educational opportunities to encourage citizen involvement in understanding and securing habitat within the Briones Bioregion. With additional data and appropriate models, the Trust may be able to assist encompassing community efforts to develop similar programs (i. e. Pinole, El Sobrante, Lafayette, Pleasant Hill). The methods and processes incorporated in this report can be utilized in a wide variety of situations such as: habitats, communities, geographic area or watersheds, including urban, rural and wildland environments.

One purpose of this program is to bring science into the land use evaluation process. There is precious little rigor being placed on biological evaluations and there is virtually no scientific precision being applied to the land use decision-making process. Citizens are generally ill-equipped to evaluate or counter information presented by developers and documents such as Environmental Impact Reports. There are few, if any, standards for biological studies which are used in the decision-making process. A fundamental flaw in the process is the usual lack of opportunity for the general public to present credible information based on sound scientific principles. If this ongoing process, which this report exemplifies, is successful, a new level of citizen empowerment will be realized. Clearly, information is power. Who better deserves that advantage than citizen residents who know and have a vested interest in the protection of valuable habitats, and more importantly, the biological diversity in the vicinity of their homes.

Robert C. Stebbins, Professor Emeritus
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Introduction

The purpose for preparation of the Briones Bioregion Resource Inventory by the Martinez Regional Land Trust is to identify natural and cultural resources within the Bioregion which require land preservation and restoration efforts.

By identifying ecosystems and habitats, and entering information on the diversity of plants and animals into a computerized database, this inventory will serve as an accessible baseline which can be readily expanded.

The published version of this booklet will be used to educate legislators, government leaders, community organizations, and students of all ages to learn to respect and care for the environment.

The section on field observation guidelines, which can be used by the public to help us add to our resource inventory database, will also be offered to local science teachers for use in their curricula. Proper use of the guidelines will be beneficial to both those collecting the data and to the work of the land trust.

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Special thanks to Dr. R. C. Stebbins for his support and for setting a standard of achievement for this project.

About Biodiversity

Biodiversity, short for biological diversity, is a term being more and more widely used to describe the incredible variety and complex interconnectedness of our terrestrial environment. As defined in the proposed U.S. Congressional Biodiversity Act (HR 1268), biodiversity is "The full range of variety and variability within and among living organisms, and the ecological complexes in which they occur, and encompasses ecosystem or community diversity, species diversity, and genetic diversity." (Jensen, et al, 1990.) In other words, biodiversity is nature's way of not putting all her eggs in one basket.

Understanding and maintaining biodiversity requires extremely careful attention to environmental details, often in the absence of adequate scientific knowledge. Disturbances in seemingly minor elements of a complex ecosystem may have dramatic consequences which may not be detectable until many years after the disturbance (Jensen, et al, 1990). One of the most troublesome aspects of defining and understanding biodiversity is an apparently diminishing awareness of the natural world in our increasingly urbanized and technological society. We are becoming ignorant of natural processes—only recently has modern civilization begun reconsidering the importance of environmental issues, and asking questions such as "how do ecological communities work?"

Perhaps the most important current issue related to biodiversity is the increasingly rapid rate of species extinction. Several respectable scientific estimates place the current worldwide rate of species extinction at an average of *one or more per day*. The consequences of this horrendous destruction may never be fully understood, but there should be little argument that a large-scale reduction of species (and hence, of biodiversity) is a terrible occurrence. The problem is made even worse by the fact that, "Because species are dependent upon each other through predator-prey relationships in food webs, and through cooperative relationships like plants and their pollinators, when one species declines...loss of critical, key species in an ecosystem can result in a cascade of extinctions of other species that are linked together" (Terborgh and Winter 1980, and Jensen, et al, 1990).

The problem of species extinction is particularly acute in the world's vanishing rain forest, where studies have shown that a single tree may contain dozens of unique life forms. However, things are also near calamity in the United States, where environmental negligence on a massive scale is creating a potential for ecological disaster which continues to be largely ignored. (For example, there is little apparent evidence that the concepts of resource protection and biological diversity are being considered by the Governor's Growth Management Task Force.)

Another problem with biodiversity is that it is extremely difficult—if not impossible—to reconstruct an ecological community once it has been altered. Teaching people to care for the environment in their local area is one way to start; if our booklet can help even a few people to increase their understanding of, enjoyment of, and love for their environment, we will feel totally successful.

An excellent discussion of Biodiversity can be found in Jensen, Deborah B ., Torn, Margaret, and Harte, John, *In Our Own Hands: A Strategy for Conserving Biological Diversity in California*, California Policy Seminar Researach Report, University of California, Berkeley, CA, 1990. Of singular importance are pages 2-9: "Why Care about Biodiversity?" and "Ecological Goods and Services".

Description and History of the Briones Bioregion

Geography

Roughly ten miles long and ten miles wide, the Briones Bioregion forms an ecological "island" ringed by the cities of Oakland, Berkeley, El Cerrito, Richmond, El Sobrante, Pinole, Hercules, Rodeo, Crockett, Port Costa, Martinez, Pleasant Hill, Walnut Creek, Lafayette and Orinda. The bioregion is bounded by the Carquinez Strait to the north, Interstate 680 the east, Highway 24 to the south, and the Berkeley/Oakland hills to the west (see title page map).

Along the northern border, hills rise steeply from sea level to as high as 245 meters (800 feet). Part of the Coast Range, the Briones Hills reach a high point of 452 meters (1483 feet) at Briones Peak. Alhambra Valley lies below these hills at approximately 90 meters (300 feet). A number of other hills rise as high as 305 to 450 meters (1000-1400 feet).

Several active faults in the area contribute to the rugged nature of the terrain. Many creeks run from these hills. Some of the larger creeks—Alhambra Creek, Franklin Creek, Grayson Creek—flow east and north to Carquinez Strait. Other creeks flow westward through the bay cities into San Pablo and San Francisco Bays. These western creeks include Wildcat Creek, San Pablo Creek, Pinole Creek, Refugio Creek, and Rodeo Creek.

Climate

As most San Francisco Bay Area residents know from experience, weather in many parts of the area can vary noticeably over a distance of just a few city blocks, and a one-hour summer drive from the coast to the inland valleys may take one through temperature changes of as much as 25-30 °C (≈50 °F). Such variations in weather are known as microclimates. Small-scale microclimates can be observed from one side of a hill to another, and from hilltops to neighboring valleys. The rugged Bay Area landscape makes each small area slightly different, and thus supports a wide variety of vegetation, resulting in an unusual diversity of habitat types within the region. The region as a whole has what is known as a Mediterranean climate, with warm, dry summers and cool, damp winters.

Just a few miles west of the Briones Bioregion, water being forced eastward deep in the Pacific Ocean comes to the surface along the California coast. This nutrient-rich upwelling, which contributes to an abundance of marine life in coastal waters, occurs mainly in summer and fall, at the same time that the sun is evaporating large amounts of water out over the ocean. As moisture-laden ocean air moves eastward toward land and passes over the cold water from the ocean depths, the moisture condenses to form the famous San Francisco fogs.

Meanwhile, in the inland valleys, daytime summer temperatures frequently approach and even exceed 40 °C (104 °F). As heated inland air rises, cooler air is drawn in through gaps in the surrounding mountains, especially the Golden Gate and the Carquinez Strait—the northern boundary of the Briones Bioregion. Air and fog from the Pacific Ocean flow inland through the Carquinez Strait until the inland temperature stabilizes, in a cyclical pattern which significantly influences temperatures in the Briones Bioregion.

Passing through the Caldecott tunnel between Oakland and Orinda, one may encounter a temperature change of as much as 12 °C (20 °F) in just a few hundred yards, along with a noticeable change in humidity and roadside vegetation. The Caldecott tunnel phenomenon can be explained by the fact that central Contra Costa County, including the Briones Bioregion, is shielded by the Berkeley/Oakland Hills from the most direct effects of coastal air and fogs and the temperature equalization provided by San Francisco Bay itself.

The presence of the Berkeley/Oakland hills also significantly affects the average annual rainfall in the Briones Bioregion. The City of Orinda, on the western edge of the bioregion directly inland from the wind gap of the Golden Gate, receives approximately 813 mm (32

inches) of average annual rainfall, while Walnut Creek to the east receives an average of 584 mm (23 inches), and Martinez to the north receives a paltry 406 mm (16 inches) of moisture.

Geology

The geologic processes which created the Briones Hills over millions of years are still changing them as we watch. The hills are part of the Coast Range, which runs along the western coast of the United States for almost 1000 kilometers (625 miles) from Oregon in the north all the way to the Transverse Ranges in southern California. The Briones Hills contain tertiary and cretaceous strata (40 to 80 million years old), usually only minimally metamorphosed. Near Martinez, the bluffs overlooking the Carquinez Strait reveal many kinds of rock—including sandstone, shale, and limestone—containing many varieties of cretaceous fossils of both divisions. Detrital deposits suggest that the area has been subject to widely varying levels of rainfall. Soil type varies from rich alluvial to sandy clay to rocky fragments (Collier, 1983).

Outcrops near the Hayward fault (just west of the Briones Bioregion) expose Franciscan rocks typical of northern California coast ranges, a mixture of muddy dark-colored sediments, red, green, and brown cherts and lava flows of black basalt. Long zones of dark green serpentinite mark lines of smaller faults. East of the Hayward fault, the Franciscan rocks are mostly buried under thick deposits of muddy sediment from sea-water which covered the coast range perhaps 14 million years ago. Weak, younger rocks, consisting mostly of thinly-layered mud and sand, weather and erode to form softly-rounded hills subject to frequent landslides.

Locally active members of the infamous San Andreas fault system include the Hayward Fault, mentioned above, and the Calaveras fault, which runs under the south approach to the Carquinez bridge in the northwest part of the Briones Bioregion. Other major faults in the bioregion include the Pinole, Moraga, Wildcat and Franklin faults. The Concord fault lies to the east.

Hydrology

Without water the Briones hills would resemble a moonscape. Fortunately, a few inches of rain do fall, and the water, constantly moving, constantly changing its form becomes a hydrology cycle. At Briones it becomes cycle within cycle.

The largest cycle crosses the state with water rising as vapor from the Pacific Ocean to the west to fall as rain or sift down as snow in the Sierras. In summer the Sierra snows melt into rivers joining the great Sacramento River to flow again west through the Delta, through Carquinez Strait past the northern shore of the Briones Bioregion to San Pablo Bay, San Francisco Bay, westward through the Golden Gate and back to the Pacific Ocean.

Within this large cycle a second more local cycle brings moisture to the Briones Hills as fog or winter rain to fill creeks, marshes, reservoirs, or to percolate through the soil, into the roots of plants and trees, or deeper into the soil, increasing the groundwater. Some of the groundwater re-emerges as springs or seeps—and trickles or rushes and tumbles back to the bay via at least 39 creeks throughout the watershed. Already recorded are Alhambra, Franklin and Grayson Creeks which flow north to Carquinez Strait, and San Pablo, Pinole, Refugio, Rodeo Creeks which flow west to the bay. Colorful, historic names, School House Creek, Bear Creek, Rose Creek, Fault Creek, Boy Scout Creek, Dutra Creek, Periera Creek, Oak Moth Creek, Baby Bottle Creek, Inspiration Creek, Wildcat Creek, Lauterwasser Creek, Barn Creek grace these watercourses and wetlands. Many creeks which before cattle were "permanent waters" have become intermittent. "All over the west, fencing a watershed results in reconversion of intermittent into perennial creeks." (Jim Dunne, personal communication 1992).

Local rainfall runoff satisfies about 5 per cent of the water needs of the East Bay cities. In 1919, to solve the East Bay's chronic water shortage, San Pablo Reservoir was built. In 1929 the larger water cycle of Sierra snows was tapped. Mountain water stored at Pardee Reservoir on the Mokelumne River and channeled by aqueduct, crossed the Central Valley of California, and the Briones Hills in the Coast Range to flow into San Pablo Reservoir.

In 1964, Briones Reservoir was built along Bear Creek (and many acres of riparian forest removed) to store yet more mountain water from Pardee Reservoir. No fishing or boating is allowed at Briones. Around its clear, deep blue water grows a stable lakeside habitat.

The largest water cycle from ocean to Sierra snow, and the local cycle of rain and fog in the Briones Hills surround the inner water cycle. The inner cycle moves through the living plants and animals. Through water the nutrients in soil become available to plants. Water is an important part of living tissue, either as liquid water or as part of essential organic molecules. Water serves as a means of thermal regulation for both plants and animals. It is the medium by which mineral nutrients are removed from land and added to local ecosystems.

Native Americans of the Martinez Area

One of the most regrettable things about the history of Native Americans in the Martinez area is that we know so little of it. We have some historical evidence—the early Spanish explorers and missionaries often kept diaries and journals and wrote many letters and official reports. There is some, but not much, archaeological evidence. Martinez natives left few artifacts and built no monuments. The most interesting sorts of information come from the anthropologists at the University of California who were able to interview some of the aged descendants of the various Ohlone tribelets around the turn of the century.

There is evidence that the San Francisco Bay Area has been inhabited for at least 7,000 years. Anthropologists, digging down through the shell mounds, were surprised to find that artifacts from the lowest (earliest) levels were almost identical to those found in the uppermost (most recent) levels. The only significant change they found was that the position of bodies in burials had changed, perhaps indicating contact with a group having somewhat different burial practices.

This apparently little-changing life-style over a very protracted period of time could be attributed to their "primitiveness," or perhaps to the fact that they had early-on perfected a system of living that they liked very much and saw no need to change.

The Bay Area, prior to the arrival of the Spaniards, was a very different kind of place than it is now. Hillsides which are now commonly golden-brown during the summer months were, two hundred years ago, green and lush throughout most of the year. The hills held oak, bay, and and here and there redwood forests. The meadowlands were covered with tall native bunch grasses now almost completely replaced by European annuals. The seeds of these grasses were probably brought in on the hides of imported cattle. Marshlands around the bay contained thousands of acres of tule marsh, pickleweed, and cordgrass swamps. The whole area had many moist, often swampy, places that are now either filled in or drained. Many of these swampy areas were described as having springs, brooks, ponds, and even fairly large lakes.

The amount of wildlife was incredible. All the early visitors were astounded by the number and variety of birds and other animals, particularly in wetlands. This was not just because the area was unspoiled by modern development—many of the observers were travelers who had seen unspoiled places all over the world—this area was truly unique for its variety and productivity. The vast amounts of fresh water flowing over the land and into the bay produced an assortment of plant and animal life, and fish and shellfish in almost unbelievable amounts.

The area was also quite hospitable to people. The Bay Area is thought to have had the largest concentration of Native Americans north of Mexico. At the beginning of the 20th century, a total of more than 400 shell mounds were found on the shores around the bay, as

well as many village sites further inland. In contrast to modern civilization, the natives made few if any attempts to "dominate" or "conquer" nature—they were a part of it.

We have almost no specific knowledge about the aboriginal people who lived in the Martinez area. The physical evidence is very limited: a few grinding stones, a few arrowheads. The Martinez natives left no shell mounds, because prior to modern influences the water in the Carquinez Strait and much of San Pablo Bay was mostly fresh and thus contained no shellfish. There are fresh-water clams in the delta, but if the Martinez natives ate them they didn't leave any discernable middens. What they apparently ate, unlike other Bay Area natives, was considerable quantities of salmon. They caught the fish in nets using the tule reed boats found all over California. Known as Karkins (Carquinez is the Spanish rendering of this word), these people were a tribelet of the Ohlone group.

The early European settlers generally had a low opinion of the natives and so made little effort to distinguish one group from another. The following description is a composite of the information we have of the natives from Monterey to Marin. Collectively known as "Costanoans," "Diggers" (a pejorative term), or "Ohlones," the name that the few survivors prefer, they lived in shelters framed with tule stalks. These simple structures could be built in a couple of hours and were often abandoned or burned when the flea population made them uncomfortable. The sweat houses, or "Temescals" were somewhat more elaborate. These were a combination men's clubhouse and hunters' shrine where the men would go to purify themselves before a hunt.

What they hunted and ate gave them a richly varied diet. They would sometimes smoke out yellow-jacket nests and toast the grubs on tiny skewers. Grasshoppers were abundant, as were gophers and rabbits. Although they gathered a number of grass and flower seeds, their principle source of carbohydrates was acorns.

The process of preparing the acorns was rather complicated. First, the acorn caps and shells had to be removed, then the nuts were ground by pounding them in a stone mortar with a stone pestle. Next the meal was put in a basket and was soaked and rinsed to remove the bitter tannin. The acorn meal was then placed in a water-tight basket with fresh water (the California natives were probably the world's best basket-makers). Baskets could not be put on a fire, so special stones were heated in fire, briefly rinsed, and put in the basket with the meal. When the stones cooled, they were taken out and replaced by hot ones until the water boiled and the acorn meal was cooked. It was eaten as a kind of mush or was fried on hot stones into a cake that could be kept, taken on trips, or traded for other goods. All this, including making the baskets, was considered women's work.

Men's work was hunting. Small creatures—rabbits, gophers, and most birds—were seen as having little spiritual power, so no particular tribal rituals were necessary to hunt them. Before hunting the larger animals—deer, antelope, elk, and bears—there were considerable preparatory customs to be adhered to before the hunt could begin. A hunter could not eat meat or fish. He had to live apart from his wife during the days preceding the hunt and was not even allowed to look at her. He underwent a purification in the sweat house. Through discipline and self-denial he opened himself to the spirit world so as to think and become as much like his prey as possible.

On the day of the hunt a hunter would sweat again, bathe, and rub his body and his weapons with sweet-smelling herbs. He would then, with the help of other hunters, paint appropriate designs on his body. He would often don a deer-head mask and carefully try to become part of the herd. The hunter would get very close to the deer and shoot his arrows. If a deer was killed, it was considered to have given itself to the hunter. This was not just a slaughter, it was a religious act of considerable significance. After a prayer and a gesture of thanks to the the deer, the hunter would carry the carcass back to the village.

A hunter would eat little, if any, of a deer he had killed. The meat was distributed along formal lines to his family and the community. This was part of the Ohlone's life of sharing; quite different from life in the modern world. They were not acquisitive in the least. They were not, except in games, competitive. The most honor in Ohlone society came to those who showed the most moderation and restraint, to those who were able to share most generously.

Agricultural History

The local use of the name Briones in the Briones Bioregion area dates back to Felipe Briones, a retired Spanish soldier who built a home for his family in 1829 near what is now the Bear Creek Entrance of Briones Regional Park. Traditional stewardship of the land by the Native Americans had modified the land for thousands of years, long before the Spaniards ever set foot in the area. Regular burning of grasslands by the Costanoans and Bay Miwok held wild vegetation at a stage of succession to afford seeds for a nourishing native food called Pinole. Willows, redbud, elderberry were managed and pruned for basketry twigs. Land was managed to encourage subterranean vegetables—Chlorogalum, sedges, Brodiaea. Trees were manicured to produce long, thin, straight stems without nodes for baskets. Pine roots were managed for basket-making. "Brush-crushing" encouraged certain shrubs, and Baccharis was controlled by trampling. By clearing around them plants like Muhlenbergia grasses were encouraged to grow and spread. Food plants of rabbits and deer, were managed to attract animals, and certain aromatic plants may have been encouraged to attract large ungulates by their odors. Plants were gathered for medicinal qualities. Large insects, and insect infestations became windfalls of food.

The natives respected spirits of rocks, trees, animals, rivers, lonely places, fog, sun, moon, wind, stars. "All of these were living and active, and men had always to take them into account" (*Story of Briones,* 1978).

Although no major treaties were made with the Native Americans, the government of Mexico in the early 1800's granted the Briones Hills to Spanish families settling there in six large parcels. Rancho Bóca de la Canada del Pinole (rancho at the mouth of Pinole Canyon) of 13,316 acres was issued in 1842 to Felipe Briones' widow. The smallest grant, Acalanes, was 3,329 acres. Canada del Hambre Las Bolsas, San Pablo, and El Pinole were larger than that of the Briones family. The largest, El Sobrante, comprised 20,565 acres.

Agriculture in the Briones Hills after the Native American stewardship and Spanish crops and cattle, followed two more overlapping stages: the Early American stage of grain and coal, and the Middle American of fruit. Alhambra Valley with its orchards and vineyards became in the 1850's and 1860's the county's most important fruit growing area.

Parcels of land remained large in the cattle-growing areas, and smaller in fruit-growing Alhambra Valley.

Cattle grazing has been the major land use in Bear Creek watershed and hills since the Briones family settled there, and many families developed small dairy farms. Barley began to be cultivated the 1890's. Unirrigated truck crops covered alluvial soil in Bear Valley.

Dryland commercial tomatoes grew in Bear Valley until the 1960's when two developments made them unprofitable—the closing down of the canneries in Martinez and the increasing use of the mechanical tomato picker from the University of California.

Although moved from the field at the top of the hill on Alhambra Valley Road, (Pig Farm Hill), there is still a pig farm in the hills. (Charlene Perry, personal communication 1991)

Pear Orchard History

Members of the Martinez Regional Land Trust, while conducting a resource inventory of our area, became aware of an old pear orchard. We did not, of course, physically discover the orchard, it has been right where it is for a long time. What we did realize was that, with all of the development which has been going on in the vicinity, this might be the only pear orchard remaining in a valley that once abounded with them. Because of its unique status we felt that the pear orchard was a resource worth preserving. It is unlikely that the orchard will be developed because it is part of Briones Regional Park, which is owned by the East Bay Regional Park District (EBRPD).

The pear orchard is located in Alhambra Valley, bordered on the south by Alhambra Creek and on the north by Vaca Creek and Alhambra Valley Road. Entrance to the orchard is off

Alhambra Valley Road just opposite the entrance to Vaca Creek Road. The orchard is approximately 9 acres in extent, consisting mostly of Bartlett Pears which are gradually being replaced by native trees such as Coast Live Oak and California Laurel—the process is interesting to watch. The park district, largely for fire prevention reasons, has tilled or disked the ground between the trees each year, using equipment which doesn't reach all the way to the trunks of the trees. As a result, the native trees which are naturally seeded, probably by jays and squirrels in the orchard, grow up inside the dripline of the pears. When this happens the oaks and the laurels grow much larger then the pear trees and eventually shade them out. Should this process continue, the oaks and laurels will eventually dominate the orchard.

Since the pear orchard has some value as an historical landmark, we thought it might be interesting to trace the history of this bit of land. The whole area was once oak woodland with native grasses beneath and between the trees. The indigenous grasses, unlike the European grasses which have since replaced them, stayed green during the summer, giving the area quite a different look. The native Americans, the Saklan tribe of the Costanoan Indians, lived lightly on the land and left few indications of their presence. There are two grinding stones higher up in Briones Regional Park but no trace at all in the orchard itself.

Elk, deer, and bear were quite common until the arrival of European settlers, at which point in history many of the native fauna declined in numbers. The deer have made a comeback now but the elk and bears were hunted to extinction. Mexican settlers introduced cattle and horses to the area—these animals often carried European grass seeds in their coats, hooves and feces. These seeds of plants adapted to disturbance grew in soil trampled by cattle and soon multiplied so rapidly that they displaced many of the native grasses.
The Mexicans also brought Cholera and other diseases. Soon the native tribes went the way of the elk, the grizzly, and the native bunch grasses.

The first registered owner of the pear orchard and surrounding lands was Ignacio Martinez. Martinez was born in Mexico during the time of the American Revolutionary War. He served at army ports in Santa Barbara and San Diego. He was transferred to San Francisco and became commandante of the Presidio. In 1823 he was granted Rancho El Pinole, consisting of 17,786.49 acres. Martinez, like most other Mexican ranchers, raised cattle and horses. The cattle were raised primarily for the hides and tallow, which could be sold for cash or trade and exported. The beef itself was not held in high regard—it was considered acceptable for travelers to kill and eat someone else's cattle as long as they left the hide for the rancher.

In addition to his cattle, Don Ignacio grew the first fruit trees and grapes in the area. Martinez had nine daughters and two sons. One son, Vincente, built the two-story adobe which is now part of the John Muir National Historic Site. Apparently, although the records are not clear, Martinez's daughter Encarnación had bought jewelry from Simon Blum on credit. When she could not pay for the jewelry, Blum foreclosed, and her land (including the pear orchard) was sold on the courthouse steps in 1874 for $780. The buyer was one A.P. Williams. The next year Blum, who started out as a traveling peddler and became a real estate dealer and founder of the Bank of Martinez, bought 525 acres of the property from Williams.

Dr. John Strentzel, who settled in Alhambra Valley in 1853, was probably the first person to plant European wine grapes in the area. These grapes did very well, and soon much of the valley was planted with grapes. Major William Cluff, who bought the land including the current orchard in 1887, had 50 acres of grapes planted under the direction of his nephew, J.E. Colton. In addition to growing grapes, Colton operated a rather impressive winery. From an initial capacity of about 15,000 gallons/year, Colton expanded to 175,000 gallons in 1910, second only to the giant Richmond Winehaven operation.

Two major events brought the grape-growing and wine-making era to a close. First was Phylloxera, or plant lice, which devastated vineyards around the world. In France alone, 2.5 million acres of grapes were destroyed. Some native American grapes are resistant to Phylloxera and the more desirable European grapes can be grafted to the American root stock. This was done to some extent in Alhambra Valley, but many of the growers, including John Swett, began to plant more fruit trees in response to the coming of Prohibition. A few growers still produced grapes for home wine-makers, and when Prohibition was repealed some people

reopened or started new wineries. As of mid-1991 there is only one winery still in operation in the Martinez area. It is interesting to note that, in the past few years, a number of amateur wine-makers have been planting grapes on local properties.

Although fruit had long been grown in Alhambra Valley, the end of the grape era saw a change to other crops. The Bartlett Pear seemed best suited to the area and was extensively planted from about 1916 through the 1920's. Bartlett's have few pest problems, can tolerate the local dry, hot summers without irrigation, and bear fruit which can be picked while hard and green for easier packing and shipping. With the modern price of land in Alhambra Valley as high as it is, it would be impossible to pay for land by any legal agricultural venture, so the pear orchard is becoming, by virtue of its protected parkland status, a kind of historical monument.

Two members of the Martinez Regional Land Trust (MRLT) spent a day in the Contra Costa County records office and were able to trace the ownership of the pear orchard from Ignacio Martinez's land grant in 1823 to the sale of the property by Wilhelm and Nell Hirshkind to the EBRPD in 1967. It should be noted that the pear orchard was never a discrete property—it was always part of larger properties of various sizes. In its first 144 years of registered ownership, the pear orchard changed hands 13 times. A list of the owners and the dates of sale follows this summary.

Several things have been happening to the orchard during the past few years. The California Conservation Corps did a wonderful job of cleaning out most of the underbrush (including a lot of poison oak) and trimming oaks and other trees, giving the place a much more parklike feeling. A group from the Diablo Valley College Horticulture Department cut the dead wood out of and pruned a number of trees. The orchard was visited by Nancy Brownfield, Integrated Pest Manager for EBRPD, and by Janet Caprile, Pomologist, University of California Agricultural Extension Service. Both were very considerate and offered many valuable suggestions for maintaining the orchard. The Martinez Regional Land Trust, with the permission of the EBRPD, hopes to trim out more dead wood, do more pruning during the next dormant period, plant more trees, and plant some soil-enriching cover crops in the fall.

This is a preliminary report. More information from long-time residents is welcomed.

Pear Orchard Land Use History

1823: Rancho El Pinole granted to Ignacio Martinez.
1839: Rancho La Bóca de la Canada del Pinole granted to Felipe Briones.
1874: Unknown owner sells to A.P. Williams at tax sale (W. Smith agent for the Martinez family).
1875: A.P. Williams sells 525 acres to Simon Blum.
1887: S. Blum sells to William Cluff (vineyards planted).
1908: W. Cluff sells to John Wilson.
1910: Wilson sells to Louis Stone.
1911: Stone sells to Adeline B. Croyland.
1913: Croyland sells to Burnham.
1930: Fred Burnham sells to M.C. Mogensen Corp.
1933: M.C. Mogensen sells to Spring Hill Ranch (Mae C. Mogensen, Vice President).
1934: Mae Mogensen sells to M.C. Mogensen.
1944: Mogensen sells to Roland I. Dunn.
1945: Dunn sells to Nell & Wilhelm Hirshkind.
1967: Hirshkind sells to East Bay Regional Park District.

Natural Communities and Habitats of the Briones Bioregion

Plant life: specific for climate and site, plant life is the basic food in a natural community

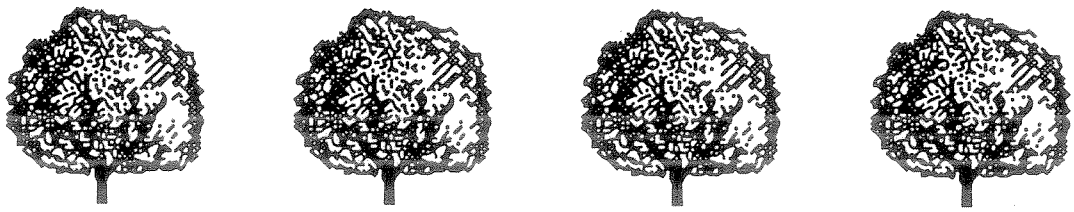
- Marshlands
  - Salt
  - Brackish (tidal)
  - Freshwater
    - Vernal pools
    - Freshwater swamps
    - Willow
    - Typha
    - Spring/seep
      - Bay -oak
      - Buckeye
      - Scrub types: Arroyo Willow, Poison Oak, Blackberry, Coyote Brush
      - Grassland types: Valley Wild Rye, Polypogon, Juncus, Mimulus-Veronica-Rorripa-Ranunculus, Meadow Barley
      - Annual weeds (pioneers on trampled or other-degraded land
  - Lakeside: low water, high water
  - Pond: ephemeral (vernal pool), mud bottom, stock
  - Riparian:
    - Redwood
    - Bay
    - Maple
    - Live Oak
    - Mixed hardwood: Maple, California Box Elder, Alder, Walnut
    - Central Coast Willow Woodland
    - Central Coast Willow Scrub
    - Central Coast Arroyo Willow Forest
    - Elymus triticoides

- Grasslands
  - Valley Needlegrass (also under woodlands and scrub)
  - Central Coast Needlegrass
  - Central Coast Natives (Stipa-Chlorogalum-Melica-California Fescue)
  - Coastal Prairie types: Giant Wildrye, Idaho Fescue, Stipa, Danthonia, Luzula
  - Elymus glaucus (also under Oak-Woodland and various scrub)
  - Elymus triticoides (Valley Wildrye Grassland)
  - Non-native Annual Weedland: landslides, heavy grading, trampling
- Chaparral
  - Chamise (Savanna)
  - Mixed: Manzanita (Rodeo shale)
- Scrub or brushland
  - Northern Coastal Scrub (Baccharis scrub)
  - California Sage Scrub
  - California Buckwheat Scrub
  - Poison Oak Scrub
- Woodland and Forest

Redwood
Bay
Knobcone Pine
Mixed Evergreen
Mixed Hardwood
Buckeye Woodland
Madrone Woodland
Oak Woodland: Coast Live Oak, Valley Oak, Blue Oak, Black Oak, Canyon Live Oak, Mixed Oak Woodland
Oak Savanna
Coast Live Oak
Valley Oak
Bluish Valley Oak
Blue Oak
Mixed Oak (Black, Coast, Live, Valley, and Canyon Live)
Cryptogamic Soil Crusts
Rock Outcrops
Disturbed Areas
Plantations: Eucalyptus, Monterey Pine, Orchards
Agriculture
Urban (Many exotic plants)

Animal life: for every plant community, every habitat, there is an animal community, often as specific for the site, and as specialized as to exist only where certain food plants exist. For each habitat we can begin to list vertebrates (mammals, birds, reptiles, amphibians, fish), invertebrates (worms, molluscs, crustaceans, arachnids, insects), and soil micro-organisms. All are crucial..

The growing database of plants and animals is too long to print in this document. More details about the database can be found on page 12 and in the appendix.



Briones Bioregion Dynamics

Because the Briones Bioregion has so much life, this will be a status report of a long term effort.

An Island

The Briones Hills rise, an island within an island, in scenic solitude above a densely populated urban area east of San Pablo and San Francisco Bay.

Why call the Briones Hills an island within an island? The outer island, the 900-mile-long State of California, has been isolated for eons by water— the Pacific ocean to the west, and by mountains—Cascades and Sierras to the east, and farther east arid land in the rain shadow of high mountains.

In California's benign climate, rich geologic history, complex topography and diverse soils have developed plant and animal habitats so varied and unique that of its 7850 known vascular plant species at least 1600 full species and many subspecies are found nowhere else in the world. Contrast the 7850 vascular plant species of California with those of Texas (5500) and Arizona (3200) which are considered species-rich states.

Elna Bakker wrote a book about the plant and animal communities so varied, unique, beautiful, spectacular in California. She derived the name of her book, *An Island Called California,* from the words of a romantic Spanish novel of the 16th century by Garcia Ordonez de Montalvo..."An island called California on the right hand of the Indies...very close to the Terrestrial Paradise". In calling California an island, Montalvo made a mistake in geography. Ecologically speaking, however, he was right.

Remnants of this "Terrestrial Paradise" can still be found in California, and even yet in the San Francisco Bay Area. One of these remnants is the Briones Hills.

What kinds of plants and animals can be found among these hills, valleys, canyons, along its streams, around its lakes and reservoirs? Are they affected by north and south-facing slopes? By the many springs and seeps along the earthquake faults, the Hayward, Pinole and Franklin faults, and dozens of lesser faults in this seismically-active area? Are they affected by being in the Briones Bioregion, a meeting place for floras from the north (Oregonian), the south (Californian), and the east (Sierra-Cascade)? (Dasmann 1981 from Udvardy 1975).

A Mosaic

The Briones Hills are indeed a mosaic. Seen from aerial photographs, and from the high hills the land lies in patterns of grassland, oak woodland, oak savanna, chaparral, north coast brushland, with riparian vegetation along canyons and streams. Water-adapted plants surround ponds, spring, seeps, lakes, and the light patches of grasses on south-facing slopes frame the dark richness of brush and forest on north-facing slopes.

Of the 273 terrestrial and wetland habitats in the Natural Diversity Data Base, the Briones Bioregion has perhaps 80 different habitats. Even as this "Preliminary" statewide data base (Holland, 1986) is currently being updated, some habitats unique to these hills may need to be added.

Database Begun

For the database of the Briones Bioregion which Karl Kuellmer and Kevin Shaw are preparing (1200 species to date) a dozen major habitat types will be coded: Aquatic, Broadleaf Evergreen Mixed Forest, Chaparral, Grassland, Lake, Fresh Water Marsh, Salt Water Marsh, Coastal Strand, Oak Woodland, Redwood, and Coniferous. Also available by computer will be the more extensive list of habitat types and their NDDB code numbers, which are uniform throughout the state.

Every effort is made not to predict according to habitat which plants and animals should appear, but to record plants and animals which were actually seen and noted in the field, remembering that if we have not found the plant or animal, it does not mean that it is not there. Sources include field studies by Dr. Robert Stebbins at the University of California at Berkeley, by naturalists at the regional parks—Briones, Wildcat Canyon, Tilden, Kennedy Grove—by Karl Kuellmer and Kevin Shaw and others on the 300 plus acres of Mount Wanda, now part of the John Muir National Historic Site, and from lists from botanists visiting Mount Wanda furnished by Herb Thurman. Sightings have been recorded by Gary Beeman, Gary Bogue, and by Steve Abbors, Jim Dunne and other naturalists at the extensive watershed of the East Bay Municipal Utilities District surrounding San Pablo and Briones Reservoirs.

A valuable part of this inventory is a summary of Dr. Stebbins' methods and maps to enable concerned citizens, hikers, university students, and with guidance, not only high school age but younger people to make valid contributions to the inventory.

The current list includes vascular plants (trees, shrubs, herbs, ferns) amphibians, reptiles, birds and mammals. Yet to be added are mosses, lichens, algae, fungi, and the invertebrates—90 per cent of the earth's animal biomass, and 95 per cent of all animal species on earth, forming the bulk of their biological diversity. (Wilson, 1991).

This begins a long-term but uncommonly timely effort. Some of these plants and animals are endangered, or on lists of special concern, "sliding toward extinction". California, according to a recent study now has the largest number of endangered species of any state. (Udall, 1991) Many are endemics, plants that occur nowhere else

What was Here?

What was here? What is here now? What plants or animals are missing? Why are they missing? When were they lost? Can some be saved?

For thousands of years Native Californians, the Bay Miwok, Costanoans, or Ohlones roamed the region. From the shores they gathered clams and crabs, from oak and mixed forests they gathered acorns and buckeyes, Pinole, a native food from seeds of grasses and native tar plant, from the uplands, deer, from marshlands, elk. Along the bay and estuary ducks, geese, shorebirds flew up in uncounted numbers.

Place names remind us of more that was here Grizzly Peak Boulevard, Grizzly Bay, Bear Creek, and the Grizzly on the California State Flag remind us of our heritage of bears. Wildcat Canyon reminds us of cougars and bobcats. The remarkable news is that cougars and bobcats still roam remote areas, a sign of some health of the land.

Cougars and wolves controlled deer and antelope populations. Bobcats fed upon rabbits and squirrels. Coyotes and native gray foxes kept rodents—meadow mice or voles, wood rats, deer mice under control. Weasels and badgers fed upon ground squirrels, moles, shrews. The small mammals of grasslands fed the raptors—eagles, hawks and kites and falcons by day, owls by night.

A balance of abundance. Unlike the golden annual grasses today, native perennial grasses covered the hills. Mixed evergreen forest of coast live-oaks, bays, madrones grew along ravines, watercourses and north-facing slopes. Valley oaks, and in the foggier western hills redwoods grew on alluvial soils. Coastal shrubland of coyote brush, poison oak, (Native Americans seem to have been only slightly or not at all subject to the effects of this poison, but used small branches in basketry, and leaves in cooking (Balls, 1962), sticky monkey flower, lupines, California sage, black sage, berries along streamsides, and carpets of wildflowers in the spring.

Was there more.? What about tiny plants and animals in the soil? In rich topsoil there may be a hundred million living bacteria per gram of soil. Many of these organisms enrich the soil. Cryptogamic soil crusts helped the soil hold moisture and texture, and helped to fix nitrogen. Bacteria in nodules on roots of legumes, and in roots of close to 200 other species add nitrogen compounds to the soil. Blue-green algae too have been found to fix nitrogen. Fungi living in and around roots—mycorrhizae—add nutrients to the soil. Many trees will not

grow without mycorrhizae. Over 90 per cent of the world's vascular plants are known to form mycorrhizal relationships which help host plants fight off harmful bacteria and pathogenic fungi, and to acquire additional water, minerals, and nitrogen compounds. And in a square meter of undisturbed forest soil there may be from 200 to 250 species of invertebrates. Among these are species of protozoans, rotiferans, helminths annelids, crustaceans, molluscs, myriapods, arachnids, and insects and their larvae.

To date there is no list of all the insect species recorded in the state, but a figure of 28,000 emerges as a conservative estimate for California. A quarter of these—perhaps 7,000 species in California—are beetles, and many of these await discovery. The Briones Hills are in the area described by entomologists as the major insect province of the state, which has a larger number of species endemic to California than any other province (Powell, 1979).

"All these," wrote Aldo Leopold (Round River 1952) are part of the digestive apparatus of the soil...It required a century of research in soil science to discover the existence of these "small cogs and wheels"..."The last word in ignorance is the man who says of an animal or plant; "What good is it?"..."If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering."

"Have we learned this first principle of conservation: to preserve all the parts of the land mechanism? No, because even the scientist does not recognize all of them."

As the forest, prairie, brushland, and the wildlife living in the Briones Hills depend upon topsoil (each inch of which may take from 500 to 1000 years to build) they also depend upon the few inches of rain which fall. The 814 millimeter (32 inch) average annual rainfall recorded in Orinda at the southeast corner of the hills, twice the 406 millimeter (16 inch) rainfall at Alhambra Valley at the far northwestern edge, about a dozen miles away supports moisture-adapted shrubs like wild currants in Orinda. At Martinez, on the drier eastern slope of Mt. Wanda, can be found a pure, parklike stand of blue oaks, similar to those frequently found on the foothills farther inland.

Cycles, and Recycling

Along with water, carbon too is cycled through every living thing. Carbon and water are sometimes held for centuries in the wood of forests. When wood is burned or decomposes, carbon as carbon dioxide and water are released into the air. Carbon is also released as the oaks and forests, the brush and grasslands use energy to respire and to grow, and by the decomposing of dead plants and animals. From the air carbon is recycled into plants through the process of photosynthesis in which green plants convert carbon dioxide and water into simple and complex sugars. These in turn can be stored as starch or cellulose (wood).

During photosynthesis plants release oxygen into the air. It has been calculated that one mature oak tree releases enough oxygen into the air to daily sustain a family of four people. While this oak tree is releasing oxygen into the air it is taking in carbon dioxide and reducing the presence of one of the greenhouse gases in the air.

One of the most interesting cycles is that of nitrogen. Nitrogen is abundant in the air (78 per cent) but as a free, colorless, odorless gas, unavailable to living things. Nitrogen is absorbed through roots of plants as nitrates (carried dissolved in water as part of that inner water cycle) from the soil. It is then combined with other elements chemically to form amino acids and proteins which make up the protoplasm of living cells of plants and the animals which eat them. Nitrogen returns to the soil through animal wastes and also through the decomposition of plants and animals when they die. Bacteria, fungi and other living things in the soil convert complex organic matter containing nitrogen into ammonia, nitrites into nitrates which become available again to the roots of plants.

Scientists have traced cycles for sulfur, phosphorus, calcium, indeed for all the other nutrients used by living things. Nothing is wasted. Each year more is known about how these cycles occur.

Environmental education, one of the aims of this paper can be approached in many creative ways. After working with youth groups in an East Bay Regional Park Malcolm Margolin (1985) wrote:

"I would assemble the kids and give them what must have been the craziest speech they ever heard. "Be quiet, please. You've got to be quiet. It's lunch time. The trees are eating. Sh-sh-sh!. The trees in the forest are always eating. It's always lunchtime. No wonder the trees are so fat... They eat all day long, all night long, every day of the year. Eat, eat, eat. Millions of mouths, always eating. No wonder trees don't move and run around and jump. They don't have time. All they have time to do is eat...The earth is like a huge banquet table, and all their lives they sit at the table, eating, eating, growing, growing, swelling. "

"I would then talk about how the trees were breathing, breathing, breathing...I would talk about drinking, digesting, circulating, and communicating. 'That bee over there is bringing a sackful of genetic messages from one tree to another. ' "

"With my fingers I would explain how trees grow—how they grope and strain at the tips of their branches and at the wiggly ends of their roots. We'd look at the trees and notice how the branches writhe and strain and how the leaves spread out submissively before the sun. "

"The purpose of this sort of presentation was not so much to teach kids facts but rather to shake them up, to make them see, perhaps to impress upon them the stark, wonderful, awesome fact that trees are alive."

Life in the Briones Hills moves in self-sustaining, self-renewing cycles. A powerful system. What fuels this powerhouse? A steady, dependable, non-polluting source of energy. It has been glowing for millions of years undiminished, a bright star only 93 million miles away—our sun. Clean energy fuels the ecosystems.

What is an Ecosystem?

Ecosystem, Ecology, Economy, Ecotone. All these words stem from the Greek oikos meaning house or place to live. An original meaning of economy is management of household affairs. Biologist Ernst Haekel credited in 1866 ,with coining the word ecology, connected. it with economy: "By ecology we mean the body of knowledge concerning the economy of nature."

An ecosystem is a more or less self-contained unit of nature that includes the physical environment and the plants and animals found there (Bakker 1984). A self-contained unit of nature might be as large as a forest, or as small as the association of microscopic plants and animals in the digestive tract of a termite.

Home Ranges and Territories

Other self-contained units of the Briones Hills could be the area in which the largest mammalian predator roams. A cougar has been found to have a large habitat, a home range of from 50 to 100 square miles, the area of the entire bioregion. Home ranges, and also territories determine some essential needs for space in ecosystems.

The concept of territory ownership in birds goes back at least as far as Aristotle (ca 350 BC). "Each pair of eagles needs a large territory and on that account allows no other eagle to settle in the neighborhood...Various invertebrates, fishes, lizards, mice and other mammals—man, unfortunately, not excepted—engage in similar battles over land ownership. Ordinarily the poorer or more scattered the food supply, the larger the territory." (Welty and Baptista 1988)

The golden eagle nesting at San Pablo Reservoir may defend a territory of 35 square miles. and the Briones Hills have room for 2 or 3 golden eagle pairs.A native gray fox or a badger may roam 2 to 3 square miles. A seven-inch garter snake was captured 10 miles away from its hibernation site. (Baker, 1981) Experiments which displaced individual red-bellied newts 2.5 miles from their original sites in redwood forests showed that although they bred in the new sites in the following two years, the impulse to return to their original site was so

strong that certain individuals returned to breed in the home sites the third and subsequent years (Baker, 1981). The tender feet of these five-inch amphibians may carry them up to five miles.

The Richness of the Boundaries

As mentioned earlier, the Briones Hills lie at the juncture of three plant provinces, Californian from the south, Oregonian from the north, and Sierra-cascade from the west. According to McIntosh (1985) large associations such as these are called ecotones. Many researchers also call the interfacing of edges of habitats or plant communities, ecotones. They are of singular value to the richness and diversity of wildlife. These ecotones or transition zones between habitats may be as narrow as a few meters. (Bakker, 1984).

An owl may perch, roost or nest in forest and hunt for food in grassland. A mouse may feed on grass seeds and hide in brush. Some edges of habitat have more diverse populations of animals This diversity is not directly controlled by climate or other fundamental environmental factors, and cannot be lowered except by removal of one of the major communities. In addition, a number of specialist populations can become adapted specifically to the transition zone. This potential for the transition zone to act as a habitat for species found in either community is termed the edge effect (Clapham 1973).

Food, Growth, Energy

Each self-contained unit of the Briones Hills,—ecosystem, community, habitat or ecological niche—is connected by not only the essentials of space, soil, water, but food. These connections, catalogs of who eats what or whom, can be called food chains, food webs, and finally, food pyramids. A short chain could begin with grass and seeds, go through a vole or meadow mouse, and end with a gray fox. Should the fox become a road-kill it could be eaten by a crow which could upon its death become a feast for dermestid beetles, and by fly larvae which on reaching adulthood could become food for a swallow or a trout. The death of any of these organisms could lead to food for fungi and bacteria adding humus to enrich the soil for the grass and the seeds. Another cycle.

The browse on young trees and brush, becomes food for a deer which is eaten by a cougar. Seeds and acorns go in a food chain through rodents—mice and squirrels— through a snake to nourish a hawk.

The relative numbers and also the mass of plants and animals in food webs have been found to form a pyramid. The plants and animals of smallest size and greatest numbers form the base of a pyramid. Many, many seeds are eaten by a mouse. A hawk eats fewer mice than the mice ate seeds. The top of this pyramid may be a single hawk.

Energy is released along the way. A pound of deer meat will not add a pound of weight to a cougar, the single predator at the top of another pyramid. Perhaps ten pounds of deer will be needed. For a deer to gain ten pounds it might need to eat 100 pounds of young twigs, or other fresh, succulent plant material to its preference.

It has been roughly calculated that for a human to gain a pound, he must eat 10 pounds of fish. The 10 pounds of fish require 100 pounds of smaller animals swimming in the water—animal plankton. Those 100 pounds of animal plankton require 1000 pounds of plant plankton. So for a human (e.g. a fisherman in Carquinez Strait) to gain a pound, a half-ton of plankton must be consumed.

If plant plankton in the Strait, or San Pablo Reservoir, or Briones Reservoir, or Jewel Lake or Lake Anza were not at least partially consumed by other living things in food webs, the water might soon be overwhelmed with microscopic plants, an algal bloom.

At the top of the food pyramid, major predators are one of the most important factors in the entire structure and diversity of an ecosystem. In a now classic story, removal of cougars, wolves and coyotes on the Kaibab Plateau in Arizona, an area only a little larger than the Briones Hills, allowed a deer herd of 4,000 to increase in 20 years to 100,000. The deer

became so numerous they destroyed the available forage and went into a catastrophic decline through starvation. (Franke and Franke 1975 from A. S. Leopold 1943).

Keystone and Indicator Species

Top predators of food pyramids are often called "keystone species" Removal of a few, or even one top predator can skew a whole system. In the Briones Hills the top predators are cougars, coyotes, and golden eagles, all of which require space. Should the borders of wild land in the Briones Hills become smaller there might not be space enough for its keystone species.

Animals particularly sensitive to pollution of streams, either in sediment from erosion of soil or chemical wastes, such as the young trout and salmon are called indicator species. Other indicator species, animals sensitive to not only polluted streams and lakes but to acid rain from air pollution are animals which breathe through their skins, frogs and salamander. These indicator species give clues to the health of the environment much as does a canary carried into a mine.

How has the Region Survived?

How did the Briones Hills, ringed by sometimes predatory cities, survive relatively intact, with enough area to carry a whole food pyramid topped by predators and raptors which need the entire space? Political and park boundaries are seldom coincidental with ecotones.

Topography has helped. "Evidently this part of the Coast Range has been submerged at various times since the mountains were formed. Imagine putting a stack of heavily buttered pancakes on a plate, the pancakes representing the harder layers and the butter the layers of soft mud, and then suppose that you tilted the plate...Nearly every hill underlain by the younger sedimentary formations is scarred and wrinkled by landslides, old ones that slumped centuries ago and modern ones moving today....some slopes are so delicately poised by nature that any development at all threatens them. These should remain forever untouched." (Alt, 1975)

Earthquake faults have helped "...on the basis of current technology, as well as historical evidence, it is reasonable to assume that during the design life of the proposed project, at least one moderate to severe earthquake that will cause strong shaking of the site" (J. H. Kleinfelder & Associates for Larry Seeman Associates, EIR 1983).

Caring people have made a difference. The many who worked through countless meetings to write the County General Plan have defined an urban limit line. The U.S. Army Engineers and the State Department of Fish and Game have a mandate to protect wetlands. Early watershed plans set aside areas in the hills to protect clean water supplies. Some of this land is still protected by East Bay Municipal Utilities District, (East Bay MUD), and some of the land has been protected for over 50 years by East Bay Regional Park District which in the 1930's began to develop parks from some of the surplus watershed land. Within the Bioregion lie nearly 11,000 acres protected in Tilden, Briones, Wildcat Canyon, Kennedy Grove, Carquinez Shoreline, and Sobrante Ridge Regional Parks. In 1991 Mt. Wanda became part of the John Muir National Historic Site. Many acres of the Briones Hills are privately owned. On a map which looks like a checkerboard, parcels of private land are protected for ten years at a time under the Williamson Act, which allows for reduced taxes as long as the land remains in agriculture.

Certain words reveal a progression of attitude regarding land—from exploitation to development to increasing understanding, respect, and appreciation: "empty land, raw land. undeveloped land, open land, natural land, habitats, ecotones, ecosystems.

Hope for protection of the Briones Hills increased when the Contra Costa County Board of Supervisor originated an interesting political compact, The Briones Hills Agricultural Preserve (Resolution #87-483) on August 4, 1987. In an enlightened precedent eight cities signed a formal agreement on April 17, 1988 to not encroach upon this area in the Briones Hills.

The cities are Martinez, Pleasant Hill, Lafayette, Orinda, Richmond, San Pablo, Pinole and Hercules.

Threats

Major threats to the 80-odd habitats in the region in addition to road building, industrialization, and urbanization include browsing and overgrazing, changes in agricultural methods, dam construction and flooding, drainage, water pollution, disturbance through trampling and motor vehicles, coastal pressures, developments for tourism, introduced species, collecting specimens, e.g. for horticulture and picking wildflowers, poaching, fragmentation of habitat, the existence of critically small populations of plants or animals, and fire. Currently under intense scientific study are effects of grazing and fire.

A major threat of urbanization in the watershed of Rodeo Creek is a proposed 635 acre cherry-stem annexation at the western end of the bioregion This includes many of the above threats, the removal and fragmentation of several ecosystems, grassland and riparian, and broadleaf evergreen forest, the removal of 4,500,000 cubic yards of hillside soil, fill in canyons of up to 40 feet deep, building of roads and 877 houses, a 200-300 room hotel in a watershed of hills rising to 800 feet above two riparian corridors, the degradation and pollution of wetlands and streams which would affect wildlife and people, both of the area and also of a community downstream.

These diverse acres, nearly a square mile, form six or seven of the most scenic miles on Highway 4. This area, an integral part of the bioregion, has been preserved as natural land by the County General Plan. Many caring people have written letters asking that the General Plan be respected, that the forest, the watershed and the wetlands be preserved.

Survival in the Future

In the past, parkland was often surrounded by miles of natural land. Now industrial and urban borders have become a threat to park wildlife. More is now known about not only the needs of wildlife but the ecological services which healthy ecosystems provide. Recreation and aesthetic values are generally appreciated. Beyond these are the purity of water, of air, the control of erosion, floods, and even of climate itself.

Scientists now emphasize that most parks—even national parks—are not big enough to preserve complete ecosystems. The number of square miles protected, in the Briones Hills Agricultural Preserve, if extended, would better provide the essential space for the range and territories of the predators—keystone species—at the top of the food pyramids. Since it is known that wildlife travels ridges and riparian corridors, protection of these ridges, shorelines, wetlands, can enhance the value and integrity of the Bioregion. Now is the time to seek ways to connect the Briones Bioregion with other large natural areas in the East Bay.

In the 1930's the East Bay Regional Parks were a far-sighted plan. Today they are *A Vision Achieved.* (Stein 1984). The coming vision is the connection and extension of these natural areas, self-sustaining ecosystems.of the Bioregion.

Land can be saved through the cooperative effort of people working with land trusts, other land conservation organizations, and public agencies.

New Hope and Awareness

The Martinez Regional Land Trust has undertaken this Resource Inventory project to create an awareness that the Briones Bioregion does exist as a unique ecological unit in need of permanent protection. While public agencies acquire land for parks and watershed protection, a land trust can offer alternative land protection techniques.

As a non-profit 501 (c) (3) land conservation organization, a land trust can accept donations of land or development rights; and depending on the property owner's circumstances, this donation may have considerable tax benefits. Bargain sales or sales of land or development rights at below fair market value also provide tax benefits to the property owner. Because the land trust is a non-profit corporation, any donation of land, development rights or money is considered a charitable donation.

The ability of a Land Trust to purchase or accept donations of development rights is a tool land trusts have used for land conservation purposes all over the United States and increasingly in Canada and Europe. For the property owner who seeks to ensure that his or her property will never be developed, selling or donating development rights to a land trust separates the right to develop the property from the fee title. Title remains with the property owner and can be sold or passed on to heirs, and the development rights are held in perpetuity by the land trust. It is the responsibility of the land trust to monitor the property and ensure that it is preserved according to the terms of the conservation easement placed on the land. Once development rights are sold or given to a land trust, a conservation easement is put on the property and the terms of the easement are clearly defined in a conservation easement document, which is recorded along with the title to the property. As title to the property changes hands, the conservation easement follows in perpetuity. In other words, an individual can only hold title to the property subject to the terms of the easement.

In most cases selling or donating development rights takes away value from the property, lowering its assessed value, which could lower property and inheritance taxes. Every property owner's circumstance is different. A knowledgeable tax attorney would be able to make the most accurate determination on the potential tax benefits.

One of the main functions of the Resource Inventory will be its effectiveness in educating legislators about the need for funding of land acquisitions in the Briones Bioregion. The Martinez Regional Land Trust will continue to seek funding from a variety of private and public sources to ensure the permanent preservation of the Briones Bioregion.

Field Observation Guidelines

Adapted from Biological Survey Studies for the East Bay Regional Parks
by Prof. Robert C. Stebbins, May, 1990

Introduction

The wild plant and animal life of the earth is under unprecedented assault by the activities of man. Although it is important to address this problem globally, in the final analysis the solutions to plant and animal decline will result from local actions that, taken together, can improve conditions for wildlife in our immediate surroundings and on a planetary scale.

One essential element of any plan to protect living organisms is a program to inventory and monitor critical species. Such a survey effort, if organized to include participation by local citizens, can serve both to create a useful set of biological information and to help educate people about the importance of wild things to the well-being of society. Though often downplayed in legal situations, even the most informal or "casual" observations may be quite helpful in the long run, especially when notes from many observers are combined. Such information has contributed greatly to the creation of range maps of plant and animal species all over the world. *Virtually any accurately described and recorded observations can provide potentially valuable data for future studies and reports.*

The following guidelines are an ongoing development of over four decades of teaching and research in the East Bay Regional Parks of Alameda and Contra Costa counties near San Francisco, California. The approach is such that it can be applied not only to large areas such as regional and national parks, but also to much smaller settings such as vacant lots, backyards, and school grounds.

A recent nationwide survey of school children reveals that, although they are more aware of world-wide problems facing the environment and wildlife than children a generation ago, they are less aware of nature in their immediate surroundings. It is important to the present and future well-being of our society, as well as for their own emotional and educational development, that children and their parents develop a concern for nature on a local scale.

Recommended field equipment

Comfortable shoes or boots
Long pants for thorn & insect protection
Layered clothing to suit all likely weather conditions (avoid bright clothing)
Avoid bright clothing
Knapsack or shoulder bag for carrying other gear
Sunglasses, sunscreen lotion, insect repellent, etc. as needed
Food & water as needed
Relevant maps and field guides
Compass (important for orienting maps and describing locations)
Clipboard and/or notebook with plenty of blank paper
Writing implements (preferably including a permanent-ink pen)
Magnifying glass
Thermometer (preferably quick-reading for greater accuracy)[1]
12-18" ruler (preferably with both English and metric markings)
25-100' tape measure (preferably with both English and metric markings)
Plastic bags with zip-locks or twist ties for storing field samples
Binoculars or telescope for close-up viewing
Forceps (preferably with curved tip)
Paper clip for determining sex of reptiles [2]
Camera w/telephoto lens and extra film
Portable tape recorder for making verbal notes

Selecting "target" species

Given the vast number of organisms which may be present in even a relatively small open space area, it is usually pointless to try to inventory and monitor all of them. Although in making a list of target species one runs the risk of overlooking species which may turn out to be important, one should start with some sort of guess as to which species most deserve special attention. As knowledge of the local environment grows, the list of targeted species can be modified through experience.

Species identification and other techniques

Accurate identification of species observed is paramount in field studies. Whenever there is uncertainty, a description of the species should be entered in the field notebook. Use standard terminology as much as possible—illustrations showing the standard terms for external features of many common plants and animals can be found in most good field guides. Time spent familiarizing oneself with common descriptive terms will also be helpful.

In recording observations of animals, it is important to observe first and write later, otherwise valuable information may be lost. Recording the date and location and commenting on habitat and weather conditions need not be done immediately. What *is* of immediate importance is to observe behavior and note markings and other external features useful in identification if the species is unknown. Watch long enough to acquire some understanding of what is happening, and avoid being distracted by the activity of other species unless they are involved in interactions with the one under observation. During this phase of study, disturbance to the subject should be minimized to avoid influencing behavior. With species that can be taken in hand and examined closely, a second phase of study can involve size measurement (body only and head-to-tail), body temperature and sex determination (see notes following field equipment lists), and physical and reproductive condition. Record temperature first.

Field work on birds and certain other animals can be greatly aided by learning their songs, calls, and other sounds. A person with such knowledge can determine presence and location of many species without seeing them and thus greatly accelerate distributional and census studies. Time spent learning animal sounds, therefore, will greatly improve one's effectiveness as a field observer. Sounds and their intervals can be timed, compared to more familiar sounds, and described in writing (including a description of any means used to imitate). Sounds can also be recorded graphically, using dashed lines to show sound duration and intervals, with an up-and-down line motion to show changing pitch and varying line thickness to indicate changing volume.

Many animals are attracted by distress sounds. Learning to imitate the generalized distress sound of birds can often be useful in bringing a concealed bird or other animal into the open so it can identified. However, this technique should *not* be used in formal censusing procedures. To make the general distress sound, moisten the curled index finger of a clenched

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[1] Rapid-reading 0-50 °C thermometers that reach equilibrium in about 15 seconds may still be available from Miller and Wever, Inc., Dept. H, 1637 George St., Ridgewood, Queens, NY, 11365 (phone 718/821-7110). Such thermometers are designed for taking cloacal and/or rectal temperatures, but are also useful for quickly measuring such things as air, water, and soil temperatures. To protect delicate thermometers, try using a metal tube about 1/4" in diameter as a protective container—flatten one end and put a small wad of cotton inside the flattened end to cushion the thermometer bulb. Firmly stop up the other end with a rubber eye-dropper bulb or other flexible object to keep the thermometer inside the protective tube.

[2] The copulatory organs in lizards and snakes are paired and hollow and, when inactive, lie inverted, one on each side of the base of the tail. In sexually mature individuals, sex can be determined by gently passing a slender probe (such as a straightened paper clip or bobby pin) toward the rear and into one or the other corners of the transverse vent. If the individual is a male, the probe will pass some depth into the base of the tail, as it follows the hollow of the organ. In an adult Western Fence Lizard, it may enter for a quarter of an inch or more, and in a three-foot Gopher Snake, for well over an inch.

fist with saliva and make a repeated "kissing" sound by placing the side of your mouth firmly over the base of the finger while allowing a little air to leak in on the other side. Such a sound will often bring unidentified birds out into the open in almost any part of the world.

The amount of detail recorded in field notes will depend on the interests of the observer(s) and the time that can be allotted for field studies. Extensive details are of great value in understanding species biology, but observation can become a "turn-off" if one feels overwhelmed by the process. This is where pre-organized field report forms can be helpful: to streamline the acquisition of information about local species variety and the nature of changes in species distribution, composition, and population densities (see sample field report forms following this article). Such information can be of particular importance to local park management.

Recording observations

The success of a biological survey program depends on the development of cumulative, accurate records of field observations. These observations will increase in value over the years as long as: (a) data-gathering techniques are standardized; (b) observers are instructed in techniques of accurate field observation and note-taking; and (c) records are stored in a form which is both durable and well-organized. Record as much detail as possible about each noteworthy observation. Ideally, each observational description should be numbered sequentially in correspondence to numbered dots on field maps (see mapping comments in later section). *For each observation which you record, be sure to write down as much relevant information as possible*[3].

Field map format (see sample map following this article)

If possible, make copies of all relevant maps in sections which fit your clipboard or notebook. These copies can then be used for directly plotting the location of important field observations. For in-depth projects, a computerized set of maps for the area of interest is strongly recommended. Magnetic north should be clearly labeled on each map section; a scale of 1" = 500 feet (1:6000) or finer is preferable, but any reasonably detailed map should be useful.

If appropriate maps aren't readily available, or you don't feel comfortable working with maps, be sure to take thoroughly detailed notes describing the location of each recorded observation, including county and state or other significant regional identifications for each observation. If an observation occurs at or near a road, trail, or other obvious landmark, describe the landmark as accurately as possible and give compass direction and distance from the observation point to the landmark in question. Pick a distant landmark if nothing nearby is available, and do your best to describe each observation site accurately enough so that someone else could find it using your notes.

Although a certain amount of map detail is obviously important, relatively simple maps will generally be more useful for plotting observations without generating undecipherable clutter. Copy or print maps using low contrast to enhance visibility of added markings.

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[3] Recorded items might include an observation number or other identifying label; date and time (indicate daylight savings time if relevant); the name of any observed species (if known); estimated degree of certainty for species identification (in percent); estimated number present of each plant or animal species observed; estimated age and size of each individual plant or animal observed (if determinable); sex of each plant or animal (if determinable), abundance and condition of plant leaves, flowers, and fruits[4]; size and color of distinguishing animal characteristics; and other relevant facts such as animal movements and types of activity, source of observational evidence (sightings, sounds, tracks, droppings, shed skin or hair, burrows, nests, etc.), current weather conditions, local habitat features, and so on.

[4] Try using a scale of 0-3 for relevant plant features, with "0" representing features absent, "1" representing features in an early stage of development (flowers in bud, etc.), "2" representing features at a mature stage, and "3" representing features in decline (withered, fading, etc.).

Whenever possible, cross-reference written descriptions of field sightings to grid coordinates on your maps (e.g. street maps are often divided into grids identified by letters along one axis and numbers along the other).

Use a consistent and clearly documented set of symbols and abbreviations to identify roads, gates, trails, steps, old paths, streams and drainages, vegetation boundaries, large rocks and outcroppings, soil slumps and landslides, excavations, fences and fence gaps, footbridges, culverts, picnic sites, etc. Assign labels to any unnamed but obvious features such as minor trails and creekbeds. Such labels should be clearly documented in your notes and used with unwavering consistency. For example, unnamed tributaries of major streams can be numbered sequentially in clockwise order. Such labels may prove to be invaluable in describing the location of field observations.

Ideally, maps should be produced in a form which is modifiable to accommodate corrections, changing features, and added landmarks. One map feature likely to require changes over time is the border of vegetation areas, especially those between brush and grassland. To ensure quality control, one person or small committee should have the final say in determining permanent changes for any given set of field maps. Each new version of any map should clearly indicate the date of revision.

If possible, print your field maps on acid-free archival bond paper to ensure durability. Such paper may be available at local office supply stores, or contact the Xerox corporation at 1-800-822-2200.

Identifying observation sites on field maps

Observation sites plotted directly on field maps should be represented by accurately-placed black dots numbered sequentially in the order plotted. Be sure to document the date of each observation in correlation with the map dots, using new copies of the map for each field visit or significant time period (day, week, etc.). Whenever possible, place observation numbers in clear areas on your maps and circle them to make them stand out, with a fine line connecting the numbers to the corresponding dots. Start observation numbering over again on each new map used, but be sure to label corresponding maps and notes carefully to avoid later confusion. For formal projects, all map numbers and feature identifications should be in permanent ink for durability, taking care to write and draw legibly.

When an observation site occurs at or near an obvious landmark, be sure to place the representative dot accurately relative to the landmark symbol on your map. If extra accuracy is desired, as may be required for observing some species, enlarge your field maps and add subtler landmarks as needed. "Pacing" is often the most convenient way to measure distances, so either adjust your step to the standard one yard length when measuring or find out how long your step is and pace accordingly (be sure to take the effect of slope into account when measuring distances by pacing).

Accuracy in placing map dots can be improved by orienting maps to magnetic north and by averaging the results of measurements from two distinct reference points. For convenience and to protect against accidental loss, you may wish to carry your compass on a string around your neck.

Identifying locations in dense brush or other not readily-accessible areas is best done by "triangulation," often used in locating chaparral-inhabiting birds or insects that can be heard but not easily seen. Point with your arm extended in the general direction of the sound or sighting to be triangulated, then move right or left on an arc path to a point roughly 90° from your original observation point. Assuming that the subject under observation has not moved during this process, the intersection point of the angle so defined indicates the approximate location of the subject. If two observers work together, triangulation can often be done with greater accuracy because the two points and directions of observation can be established simultaneously.

The MVZ-style advanced notebook recording system

The methods of mapping and data-gathering described above should provide a solid backbone for most simple studies, but there are situations in which it may be desirable to go beyond simple observational and recording techniques. A field notebook is the place to record more complete observations, preferably following the format in use at the University of California Museum of Vertebrate Zoology (MVZ) as described below. If a loose-leaf notebook is used, blank pages can be clipped to a clipboard during field visits. This system has been in use for many decades and has been adopted by naturalists in many parts of the U.S.A. and in other countries. A detailed description of these procedures can be found in an article by J.V. Remsen, Jr. in volume 31, number 5 of American Birds, pp. 946-953.

The MVZ system, in full, consists of three parts: a catalogue, a journal, and species accounts. The catalogue lists specimens collected by identification number, location, and date of collection. Any specimens necessary to document species presence or otherwise considered important should be given to a scientific institution for cataloguing and preservation. The journal should include general information pertaining to each field visit, such as starting and stopping times, route followed, weather conditions during each trip, etc. The journal should also include a preliminary list of the target species for the local area under study, with changes to the target list clearly noted as they occur. The species accounts, the mainstay of the MVZ system, provide specific information on each species under study: where and when observed, numbers observed, sizes and ages of individual specimens, behavior, condition, etc. Any information covered on the map sheets need not be repeated in an MVZ-style notebook, as long as all of the information will be readily and conveniently accessible in one place.

Censusing

There are many approaches to censusing (estimating target species' populations). Two methods in particular can be especially effective in biological survey work: the personal census and the group census.

In conducting a personal census, the following steps are recommended: (a) always follow the same route, alternating directions around any loops involved on alternate trips; (b) record the starting time of each trip, and try to cover the censusing route in approximately the same length of time on each visit; (c) Work quietly, by yourself—a companion may distract you and increase the risk of scaring off wildlife you are trying to observe; (d) avoid bright clothing, noisy shoes, and unnecessary movements; (e) be sure to record starting and ending times of each trip, and note weather conditions at the beginning and end of each trip and as they change; (f) target a selected list of species and carefully plot or describe the locations of all individuals heard or seen—record in your journal the list of species you are targeting and any additions or deletions from the list as they occur; (g) do not use distress calls or other special techniques to attract wildlife during censusing, as such methods introduce a difficult-to-control variable (such special techniques are more suitable for distributional studies).

The group census involves two or more observers. Each observer follows a different prescribed route and all start at the same time. Each individual should follow relevant procedures outlined for the personal census as described above. The group census makes possible coverage of a much larger area and can greatly accelerate acquisition of distributional information. For example, many bird species can be censused in spring when singing males are "on territory." The area to be studied is divided among field observers who are familiar with the species' territorial song. The procedure is repeated a number of times during the height of the breeding season with the same observers shifting their routes of coverage to even out differences in observational skills. In this way the location and number of breeding individuals of the targeted species can be determined quickly and with a high degree of accuracy.

Comprehensive recording

The goal of comprehensive recording is to obtain precise information on the overall distribution of one or more selected species throughout the entire area of study. Such information cannot be reliably provided solely by censusing or casual observations, which often miss important distributional facts such as the location of rare, spottily distributed, and hard-to-observe species and important breeding sites and movement patterns. Although a strictly casual approach may, in time, provide sufficient information on distribution and movements of target species, an effort should be made to accelerate and refine the process because of threats which may arise from uninformed public demand for land use changes or from unsound land management actions.

For example, migratory movements and use of terrestrial refuges and communal breeding sites by amphibians often represent ancient and ingrained patterns of behavior which are disrupted at great risk to the species involved. Some rare plants and animal species may be represented by individuals concentrated in patches measuring only a few yards across. It is crucial to determine and document such factors for each target species and to determine interrelationships with other species in order to accurately assess the possible consequences of open space management changes.

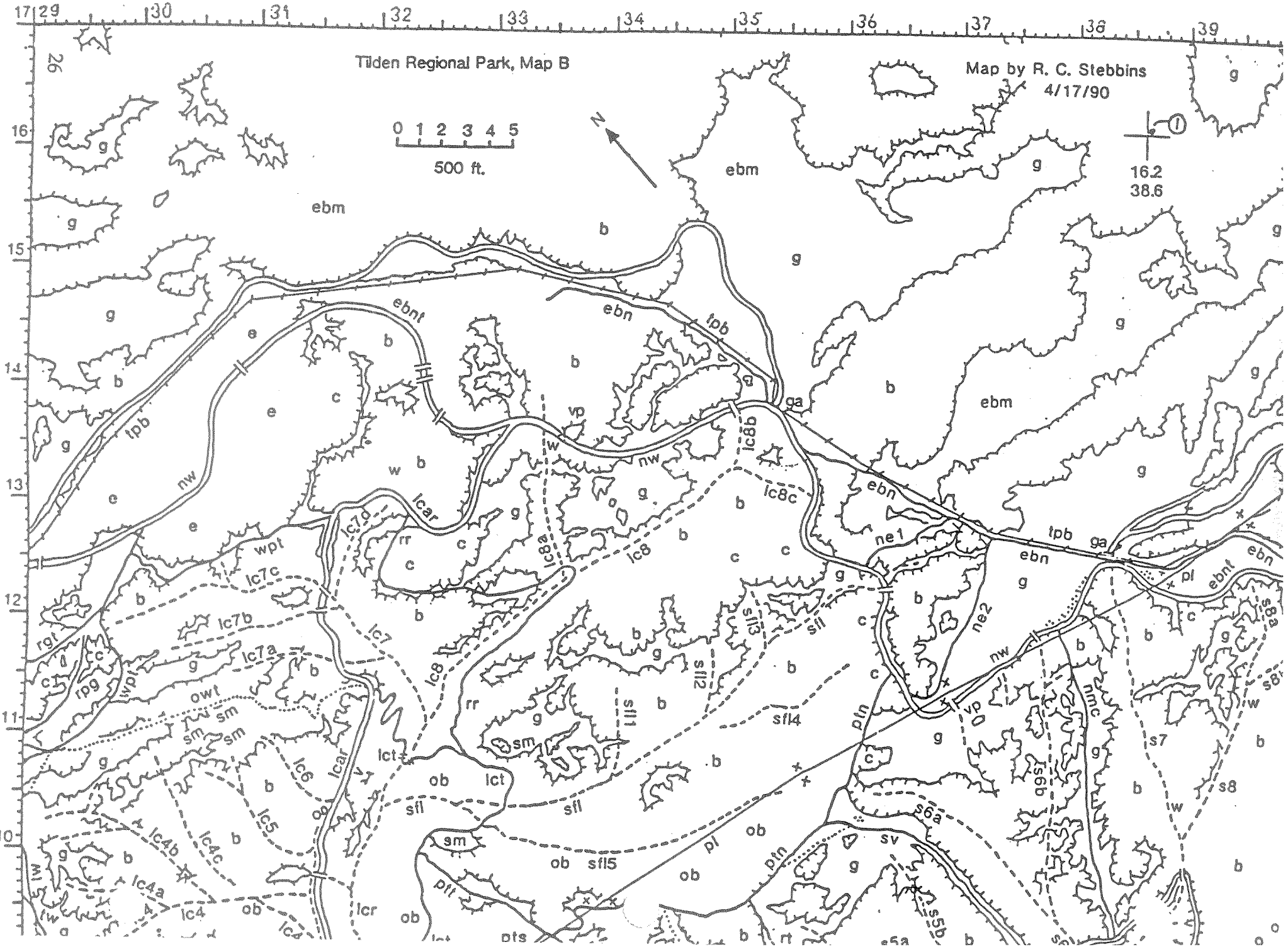
Field observations and their role in public education

As suggested in the introduction, an important goal of a biological survey program is to heighten public awareness of the importance of wildlands and wildlife to the well-being of society and the great enjoyment that people can derive from observing wild plants and animals. Many of us, as children, start out with an inherent interest in the wild creatures around us, but all too often lose that interest as we develop into adult members of nature-insulated industrial society.

Fortunately, however, our interest can usually be revived with proper exposure and guidance. This childlike interest may well reflect deep roots that nurtured humanity through the eons of our development when our lives depended on first-hand knowledge of the wild plants and animals in our surroundings. Observing nature closely creates an intimacy which cannot be recreated by pictures or the written or spoken word.

Some experts have questioned the wisdom of involving people without formal training in biological survey work. This is an understandable concern if one's only goal is to build a rigorously scientific database to guide land management decisions, but not if one is also interested in public education and awareness. With proper guidance, just about anyone can learn to produce useful observational reports which will help to fulfill both objectives.

Please see following pages for sample field map and field observation report forms.


Tilden Regional Park, Map B
Map by R. C. Stebbins
4/17/90
0 1 2 3 4 5
500 ft.
N
16.2
38.6
ebm
ebnt
ebn
lpb
ga
vp
nw
lc8b
lc8c
lc8
lc8a
lc7c
lc7b
lc7a
lc7
lc7d
lcar
wpt
rgt
lpg
owt
sm
lc6
lc5
lc4b
lc4c
lc4a
lc4
lcr
lct
ob
sfl
sfl1
sfl2
sfl3
sfl4
sfl5
rr
pl
ptn
pts
ne1
ne2
nmc
sv
s6a
s6b
s5b
s7
s8
s8a
w
g
b
c
e

Tilden Regional Park

PLANT OBSERVATION REPORT

Observer _____
Full Name / Phone (Print)

1 Ob. No.	Date M-D-Y	2 Time	3 Species Name	4 No.	5 Condition of Leaves 0 1 2 3	Flowers 0 1 2 3	Fruits 0 1 2 3	6 Comments

5 Use check marks (✓) to indicate condition of leaves, flowers, and fruits, the latter being that part of the plant in which the seeds are found.
0 = absent; 1 = in bud or early developmental stage; 2 = mature; 3 = whithering, declining, or dispersing.

Tilden Regional Park

ANIMAL OBSERVATION REPORT

Observer _____
Full Name / Phone (Print)

1 Ob. no.	2 Date M-D-Y	Time	3 Species Name	4 % Sure	5 No.	6 Sex	7 Age or Size	8 Comments

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
Copy Sent To _____

PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU. USE THE BACK FOR COMMENTS IF NECESSARY. *PLEASE ATTACH OR DRAW A MAP ON BACK.*

Scientific name (no codes): _____

Reporter: _____ Phone: ( ) _____

Address: _____

Date of Field Work: ___ ___ 19___ (day / mo. / yr.) County: _____ Collection? If yes, # _____ Mus./Herb _____

Location: _____

_____

_____

_____

Quad Name: _____ T _____ R _____ ¼ of _____ ¼ Sec _____

___ 7½' ___ 15' Elevation: _____ ft(m) T _____ R _____ ¼ of _____ ¼ Sec _____

Landowner/Manager _____

Species found? ___ Yes ___ No If not, reason: _____

Is this a new location record? ___ Yes ___ No ___ Unknown

Total # of individuals = ___ Is this a subsequent visit? ___ Yes ___ No Compared to your last visit: ___ more ___ same ___ fewer

Phenology (plants): ___ # vegetative ___ # flowering ___ # fruiting

Population Age Structure (animals): ___ # adults ___ # juveniles ___ # others

Site Function for Species (animals): ___ breeding ___ foraging ___ wintering ___ roosting ___ denning ___ other

Habitat Description: (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope)

Current Land Use/Visible Disturbances/Possible Threats

Overall Site Quality: ___ Excellent ___ Good ___ Fair ___ Poor
Comments:

Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

___ Keyed in a site reference: _____
___ Compared with specimen housed at: _____
___ Compared with photo/drawing in: _____
___ By another person (name): _____
___ Other _____

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject	Type
___ Plant/Animal	___ Slide
___ Habitat	___ Print
___ Diagnostic Feature	
___ Other	

May we obtain duplicates at our cost?
___ Yes ___ No

MAIL TO: NATURAL DIVERSITY DATA BASE, CALIFORNIA DEPARTMENT OF FISH AND GAME, 1416 NINTH ST., SACRAMENTO, CA 95814

CALIFORNIA NATURAL COMMUNITY FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____

Index Code _____ Occurrence # _____

PLEASE COMPLETE ALL ENTRIES IN THE BASIC DATA SECTION ABOVE THE HEAVY LINE. PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU WITHIN THE DETAILED SE... BELOW THE HEAVY LINE. YOU DO NOT HAVE TO COMPLETE ALL ENTRIES IN THE DETAILED SECTION US... ...E BACK FOR COMMENTS. *PLEASE ATTACH OR DRAW A MAP.*

BASIC DATA

Community Name (Terrestrial or Aquatic): _____

Date of Field Work: ___ – ___ – 19___ (day / mo / yr) County: _____ Site Name: _____

Location _____

_____

_____

Reporter: _____ Phone: ( ) _____

Address: _____

DETAILED INFORMATION

1. LOCATION

A. Is this a new location record? ____ Yes ____ No ____ Unknown Is this a subsequent visit? ____ Yes ____ No

B. Community present? ____ Yes ____ No If not, reason:

C. Quad Name: _____ T _____ R _____ ¼ of ____ ¼ Sec ____

_____ 7½' _____ 15' Additional Sections _____

D. Owner (Name/Address/Phone): _____

2. COMMUNITY DESCRIPTION

A. General Description:

B. Principal/Dominant Species:

Age structure of Principal/Dominant Species:

Special Taxa:

C. Did you make a collection? ____ Yes ____ No If yes, method of collection:

D. Species Diversity:

E. Neighboring Communities:

3. SITE DESCRIPTION

A. Overall Site Quality: ____ Excellent ____ Good ____ Fair ____ Poor. Comments:

B. Size (areal extent or stream miles):

C. Substrate/Soils:

D. Condition/Disturbance:

F. Land use:

4. OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

5. PHOTOGRAPHS

_____ Slide

_____ Print

_____ None

May we obtain duplicates at our cost? _____Yes _____No

MAIL TO: CALIFORNIA NATURAL DIVERSITY DATA BASE, c/o DEPARTMENT OF FISH AND GAME, 1416 NINTH ST., SACRAMENTO, CA 95814

Summary of Research in the Briones Bioregion by U.C. Berkeley Environmental Sciences Students, Fall 1990–Spring 1991

The culmination of the U.C. Berkeley Environmental Sciences undergraduate program is the senior seminar, a year-long course for which each student does an original research project. In the Fall of 1990, the Martinez Regional Land Trust asked for volunteers from the class to do their research on subjects relating to open space in the Martinez area, and five students accepted the challenge.

Four students did studies comparing conditions on land currently being added to the John Muir National Historic Site (the "Mt. Wanda" property—see map below) to conditions on a section of Briones Regional Park at the top of Old Briones Road, with discussions of the apparent effects of grazing on plants, birds, mammals, and habitat; the fifth student studied historical and contemporary use of local lands by Native American tribes and their descendants.

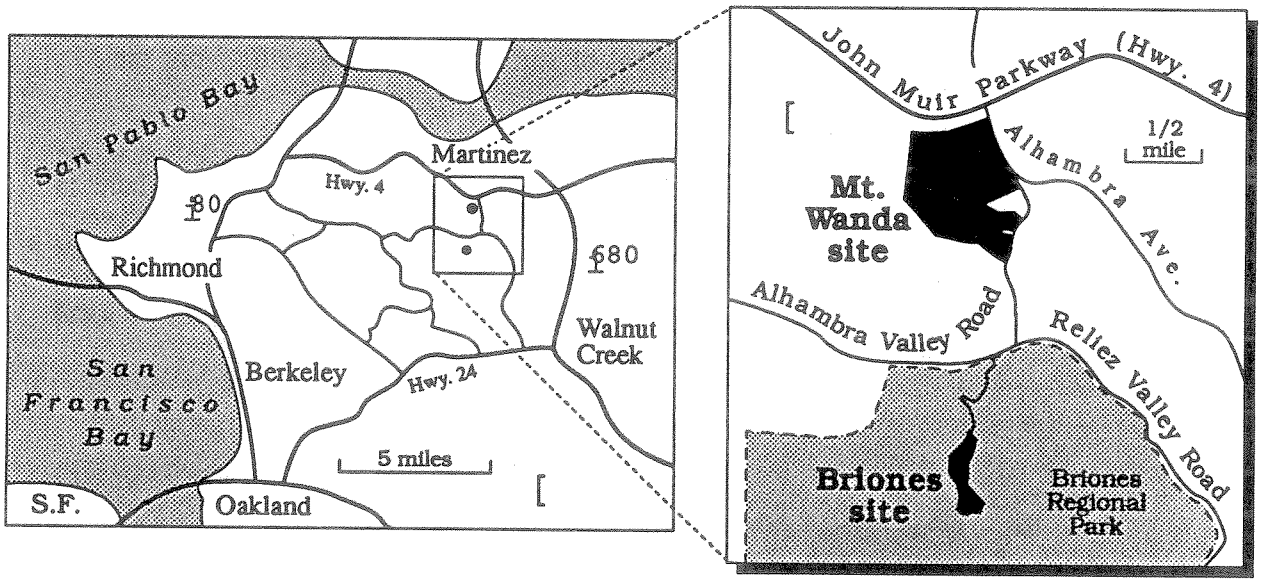


Figure 1. Site locations map.
Source: Adapted from CSAA, 1988, and Majete, 1991.

Karl Kuellmer studied the quantitative effects of cattle on ground cover, and found that there was 3-4 times the amount of bare ground on the grazed Mt. Wanda site as compared to the ungrazed Briones site. This is consistent with the theory that cattle-grazing was largely responsible (along with farming) for the widespread replacement of native perennial grasses by Mediterranean annuals in the state of California. Karl also compiled a plant species list, and found that species diversity was lower on the grazed Mt. Wanda property (see Plant Species Observation List).

Virginia Reames studied bird life at the two sites and found that while the total number of birds observed per transect was comparable at each site, species variety was

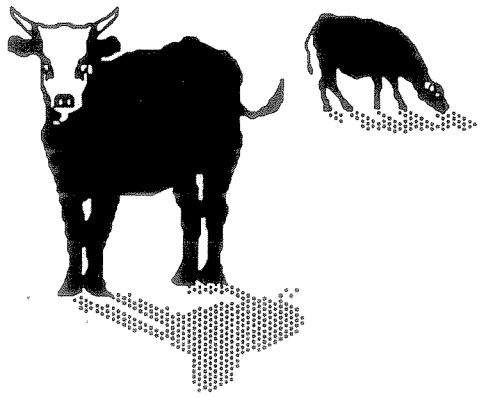
slightly higher at the ungrazed Briones site. She also found that the Briones site was preferred by brush-loving bird species, consistent with the observation that understory growth is much more prevalent at the Briones site (see Bird Species Sightings).

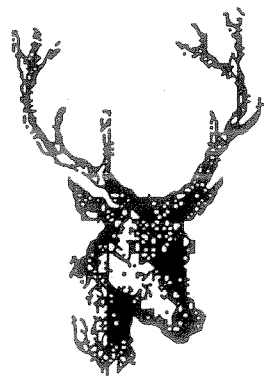
Kevin Shaw studied mammalian wildlife on the Muir and Briones sites and confirmed the presence of several species at each site (see Mammalian Species Evidence). He also concluded that regeneration of vital oak habitats is poorer on the grazed Muir property, and warned of possible increased problems for wildlife at the Muir site if and when it becomes accessible to the general public.

Marcus Cole studied changes in vegetation patterns over time using aerial photographs from different years. He compared the percent coverage of various types of vegetation (grassland, heavy brush, oak woodland, etc.), although he found himself somewhat limited by a lack of relevant aerial photographs from before 1939. He found vegetation patterns at Briones to be much more stable than those on the Mt. Wanda property.

As a group, those students studying the conditions of the Mt. Wanda and Briones sites agreed that the current level of grazing activity on the Mt. Wanda property appears to be significantly contributing to a variety of conditions which are inconsistent with both human recreational values and the site's potential as a wildlife refuge. They therefore recommended possible removal of some or all of the cattle from the Mt. Wanda property as quickly as possible.

Lisa Majete studied the historical evidence of Native American habitation in the Martinez area, with a discussion of ideas for allowing Native American descendants to utilize public lands for cultural purposes. She recommended more research and better education of the public on Native American issues, increased communication between park districts and descendants of local Native American tribes, and an effort by modern environmentalists and Native American descendants to work together to preserve local cultural and natural resources.





UCB Summary: Plant Species Observation List

Species	Mt. Wanda	Briones
Achillea sp., yarrow	X	X
Adenostoma fasciculatum, chamise	X	X
Aesculus californica, california buckeye	X	X
Amsinckia intermedia, fiddleneck	X	X
Artemisia californica, california sagebrush	X	X
Baccharis pilularis, coyote brush	X	X
Brassica campestris, field mustard	X	
Brodiaea sp.		X
Calandrinia ciliata, red maids		X
Capsella bursa-pastoris, shepherds purse	X	X
Carduus pycnocephalus, italian thistle	X	
Castilleja stenantha, felt paintbrush	X	
Centaria sp., star thistle	X	X
Chlorogalum pomeridianum, soap root	X	X
Conium maculatum, spotted hemlock	X	X
Convolvulus subacaulis, hill morning glory	X	X
Cynara cardunculus, artichoke thistle	X	
Cynoglossum grande, hounds tongue		X
Dichelostemma pulchellum, bluedicks	X	X
Diplacus auranticus, bush monkey flower	X	X
Eriogonum nudum, nude buckwheat		X
Eriophyllum confertiflorum, golden yarrow		X
Erodium cicutarium, redstem storkbill	X	X
Eschscholtzia californica, california poppy	X	X
Galium aparine, bedstraw or cleavers	X	X
Geranium molle, hairy geranium (?)		X
Helianthella castanea, diablo sunflower		X
Heteromeles arbutifolia, toyon	X	X
Hypochoeris glabra, smooth cat's ear		X

(Continued on following page)

Plant Species Observation List, Continued

Species	Mt. Wanda	Briones
Lithophragma sp.		X
Lupinus albifrons, silver bush lupine		X
Lupinus formosus	X	
Lupinus subvexus, valley lupine		X
Lupinus succulentus	X	
Madia sp., tarweed	X	X
Marah tavaceus, california manroot		X
Montia perfoliata, miners lettuce	X	X
Pellaea andromedaefolia, coffee fern	X	X
Phacelia ciliata, chinese lantern	X	X
Plagiobothrys		X
Platystemon californicus, cream cups	X	X
Quercus agrifolia, live oak	X	X
Quercus douglasii, blue oak	X	X
Quercus kelloggii, black oak	X	X
Quercus lobata, valley oak	X	X
Ranunculus californica, california buttercup	X	X
Ribes malvaceum, chapparal currant		X
Rubus parviflorus, california blackberry	X	X
Rumex crispus, curly dock	X	X
Salvia columbariae, chia	X	
Sanicula crassicaulis, pacific sanicle	X	X
Sanicula bipinnata, poison sanicle	X	X
Saxifraga californica, california saxifrage	X	X
Solidago californica, golden rod		X
Stellaria media, common chickweed	X	X
Umbellularia californica, california bay	X	X
Vicia sp., vetch Tare (2 varieties)		X
Zigadenus fremontii, fremont's camas	X	

TOTALS (both pages): **42** **51**

UCB Summary: Mammalian Species Evidence

Common species name	Mt. Wanda evidence	Briones site evidence
Opossums	(listed for area)	(listed for area)
Moles	(listed for area)	(listed for area)
Shrews	(listed for area)	(listed for area)
Bats	(listed for area)	(listed for area)
Rabbits	(listed for area)	(listed for area)
Eastern fox squirrel	sightings	nearby sightings
Ground squirrels	reported sightings, possible burrow openings	possible burrow openings
Pocket gophers	burrow mounds & openings	burrow mounds & openings
Woodrats	tracks, droppings	(none)
Field mice	(listed for area)	(listed for area)
Coyotes	droppings, possible tracks	possible tracks & droppings
Gray & Red foxes	reported sightings, droppings, possible den openings	droppings
Raccoons	reported sightings	nearby tracks
Weasels	(listed for area)	(listed for area)
Striped skunks	reported sightings	nearby road kill
mountain lions	(listed for area)	(listed for area)
Bobcats	reported sightings	(listed for area)
Mule deer	Tracks, droppings, sightings	tracks, droppings, sightings

UCB Summary: Bird Species Sightings

Common species name	Mt. Wanda sightings	Briones sightings
Turkey Vulture	X	X
Northern Harrier	X	X
Red-tailed Hawk		X
Red-shouldered Hawk	X	
Rough-legged Hawk		X
American Kestrel	X	
Mourning Dove	X	X
Nuttall's Woodpecker	X	X
Northern Flicker	X	X
Anna's Hummingbird	X	X
Steller's Jay	X	X
Scrub Jay	X	X
American Crow		X
Purple Finch		X
House Finch	X	X
Lesser Goldfinch	X	X
Lark Sparrow		X
Dark-eyed Junco	X	X
California Towhee	X	X
Cedar Waxwing	X	
Wilson's Warbler		X
Bewick's Wren	X	X
White-breasted Nuthatch	X	X
Plain Titmouse	X	X
Chestnut-backed Chickadee	X	X
Bushtit	X	X
Golden-crowned Kinglet	X	
Ruby-crowned Kinglet	X	X
Hermit Thrush		X
American Robin	X	X
Western Bluebird	X	X

Database Description and Sample Print-outs

The database presently holds information on over 1200 species of birds, mammals,reptiles, amphibians, trees, grasses, herbs, shrubs, and ferns. (We lack, as yet, insects, butterflies, spiders, invertebrates, fish, and fungi.) The following information is (or will be) recorded about each species. More categories of information will be added as needed.

The single most important thing to note about the database is that it is a predictive model and is not to be taken as proven fact. Also note that the information in the database was gathered in two ways: from other models and books, and from actual field sightings. Our goal is to have all of it backed up by field work and actual sightings that, yes, this species does occur in this habitat type in this area at this time. But it is crucial to note that, even with field confirmation, the information may not be accurate for a given patch of ground. Reasons: 1) the species may be rare and thus will not appear every place it *could* appear; 2) some condition not accounted for by the database may exclude an expected species, or include one not expected; 3) Spatial/geographic distribution may not be even; 4) The area may be degraded environmentally; 5) Other: Our goal in creating the database is not the say that this is what exists, but to aid field researchers by saying *this is what we think you will find.* Field researchers will probably find things not on our lists and not find things that are on the lists. Over time we will refine the lists to make them more accurate, but *they will never be perfect and they should never be used as a substitute for a direct field check.*

Items listed for all species:

1. Life form (bird, mammal, tree)
2. Latin name
3. Common name
4. Family and Order
5. Whether it is predicted to occur in a habitat (there are two levels of habitat type, a broad simple set of categories and a more complex set(not yet organized at this writing))
6. Whether it is native or introduced
7. A reference page in an appropriate authority (Munz or Stebbins, for example.)
8. The status as an endangered or threatened species.
9. Whether it is in the Natural Diversity Data Base
10. Geographic information: whether it has been seen or is definitely known to occur in a specific region - distinct from habitat information. (This has not yet been done.)

Items listed for birds only:

11. Resident or Migrant
12. If migrant, abundance by season
13. AOU number for phylogenetic order

For plants:

14. Whether perennial, annual, or biennial
15. Months it blooms or appears in
16. Elevation range

For mammals:

17. ISIS number for phylogenetic order

Each of the aforementioned pieces of data is contained in a separate field and can thus be searched for independently. For example, a list can easily be generated of all aquatic birds common in winter, and then organized phylogenetically. Other examples would include native perennial grasses occurring in chaparral, or endangered mammals. (Phylogenetic order is an agreed upon method of organizing species into a hierarchy of complexity from simplest to most advanced.)

Ultimately, we hope to link the database information to a series of maps using a Geographical Information System (GIS) such as MapInfo. MapInfo allows for the creation of an unlimited number of "layers" of information, allowing the user(s) to decide which combination of information will be viewed. Layers proposed include: simple and complex habitat types, soil map, topographical map, parcel map, watersheds, sightings of certain rare/endangered species, and the division into geographic regions (see 10 above). A given area can be linked to the simple database program that is part of Map Info. Though the data cannot be manipulated as well as in the original database, all of the information in the database should be available. An area can be selected and data called up for it: the birds, habitats, sightings, etc. Another advantage of MapInfo is that it operates in terms of longitude and latitude, so that sightings or other types of data which occur at a well-defined location can be entered with latitude and longitude values (if known) to be precisely displayed by the computer.

The abbreviations for the habitat type listings are as follows:

A	AQUATIC
B	BROADLEAF MIXED EVERGREEN FOREST
C	CHAPPARAL
G	GRASSLAND
L	LAKES
Mf	MARSH FRESHWATER
Ms	MARSH SALTWATER
N	COASTAL STRAND
O	OAK WOODLAND
R	REDWOOD CONIFEROUS FOREST
W	RIPARIAN WOODLAND
N/I	NATIVE OR INTRODUCED
A/P	ANNUAL OR PERRENIAL

Please see following pages for sample database printouts

Scientific Name	Common Name	Family	Habitat: A	B	C	G	L	Mf	Ms	N	O	R	S	W
Quercus agrifolia	COAST LIVE OAK	Fagaceae		x							x			
Quercus chrysolepis	CANYON or MAUL OAK	Fagaceae		x	x						x	x		
Quercus douglasii	BLUE OAK	Fagaceae									x			
Quercus garryana	GARRY or OREGON OAK	Fagaceae										x		
Quercus kelloggii	CALIFORNIA BLACK OAK	Fagaceae		x							x	x		
Quercus lobata	VALLEY OAK	Fagaceae		x							x			
Quercus wislizenii	INTERIOR LIVE OAK	Fagaceae			x						x			
Quercus dumosa	CALIFORNIA SCRUB OAK	Fagaceae			x						x			
Quercus durata	LEATHER OAK	Fagaceae			x						x			
Quercus agrifolia frutescens		Fagaceae			x									
Quercus chasii	CHASE OAK	Fagaceae		x	x						x	x		
Quercus morehouse	ORACLE or MOREHOUSE OAK	Fagaceae												
Quercus agrifolia oxydenia		Fagaceae		x	x						x	x		
Quercus suber	CORK OAK	Fagaceae												
Quercus parvula shrevii	ORACLE or MOREHOUSE OAK	Fagaceae			x									

Common Name	Scientific Name	Family	abundance		migrants				
			If Res	Sp	Su	F	W	N/I	Page
Grebe, Western	Aechmophorus occidentalis	Podicipedidae			r		a	N	7
Grebe, Clark's	Aechmophorus clarkii	Podicipedidae						N	7
Grebe, Red-necked	Podiceps grisegena	Podicipedidae					r	N	5
Grebe, Horned	Podiceps auritus	Podicipedidae					c	N	6
Grebe, Eared	Podiceps nigricollis	Podicipedidae			r		a	N	6
Grebe, Pied-billed	Podilymbus podiceps	Podicipedidae	fc					N	7
Loon, Common	Gavia immer	Gaviidae					fc	N	3
Loon, Arctic	Gavia arctica	Gaviidae					u	N	4
Loon, Red-throated	Gavia stellata	Gaviidae					c	N	5
Murre, Common	Uria aalge	Alcidae				r		N	107
Gull, Glaucous	Larus hyperboreus	Laridae					r	N	95
Gull, Thayer's	Larus thayeri	Laridae					fc	N	N/A
Gull, Glaucous-winged	Larus glaucescens	Laridae			r		a	N	97
Gull, Western	Larus occidentalis	Laridae	a					N	97
Gull, Herring	Larus argentatus	Laridae					c	N	98
Gull, California	Larus californicus	Laridae			c		a	N	98
Gull, Ring-billed	Larus delauarensis	Laridae			fc		a	N	99
Gull, Mew	Larus canus	Laridae					c	N	99
Gull, Heermann's	Larus heermanni	Laridae			fc	fc		N	101
Gull, Bon[illegible]e's	Larus philadelphia	L[illegible]e					a	N	91

Common Name	Scientific Name	AOU #	ISIS #	Family	Order
Mole, Broad-footed	*Scapanus latimanus latimanus*		5301403006009001001	Talpidae	Insectivora
Shrew, Ornate	*Sorex ornatus californicus*		5301403007018027001	Soricidae	Insectivora
Shrew, Vagrant	*Sorex vagrans halicoetes*		5301403007018039001	Soricidae	Insectivora
Pipistrelle, Western	*Pipistrellus hesperus hesperus*		5301405014019018001	Vespertilionidae	Chiroptera
Bat, Pallid	*Antrozous pallidus pacif'cus*		5301405014030003001	Vespertilionidae	Chiroptera
Bat, Brazilian Free-tailed	*Tadarida brasiliensis mexicana*		5301405016011011001	Molossidae	Chiroptera
Hare ("Jackrabt."), Black-tailed	*Lepus californicus californicus*		5301409002002005001	Leporidae	Lagomorpha
Cottontail, Desert ("Audubon")	*Sylvilagus audubonii audubonii*		5301409002008002001	Leporidae	Lagomorpha
Squirrel, California Ground ("Beechey")	*Spermophilus beecheyi beecheyi*		5301410002032005001	Sciuridae	Rodentia
Gopher, Botta's Pocket	*Thomomys bottae*		5301410003007002001	Geomyidae	Rodentia
Rat, Heermann Kangaroo	*Dipodomys heermanni berkeleyensis*		5301410004001006001	Heteromyidae	Rodentia

common name Alameda Whipsnake

life form Reptiles

genus Masticophis

species lateralis

variety euryxanthus

family Colubridae

Habitat (x for present, blank for not present)

Aquatic	
Broadleaf evergreen mixed conifer	
Chaparral	X
Grassland	X
Lakes	
Marsh freshwater	
Marsh saltwater	
Coastal strand	
Oak woodland	X
Redwood coniferous	
Coastal Scrub	
riparian Woodland	X

native or introduced (n or I) N

refer to: Stebbins page number

Federal Status Candidate

State Status Threatened

In NDDB? yes

common name MINER'S LETTUCE

life form H

genus Montia or Claytonia

species perfoliata

variety

family Portulacaceae

Habitat (x for present, blank for not present)	
Aquatic	
Broadleaf evergreen mixed conifer	X
Chaparral	X
Grassland	X
Lakes	
Marsh freshwater	
Marsh saltwater	
Coastal straNd	
Oak woodland	X
Redwood coniferous	X
Coastal Scrub	X
riparian Woodland	

native or introduced (n or I)	N
annual perennial	A
Elevation Range Low	0
Elevation Range High	5000
refer to: Munz	page number 302

Federal Status	
State Status	
Global Rank	
State Rank	
In NDDB?	

Blooms / appears in			
January		July	
February	X	August	
March	X	September	
April	X	November	
May	X	October	
June	X	December	

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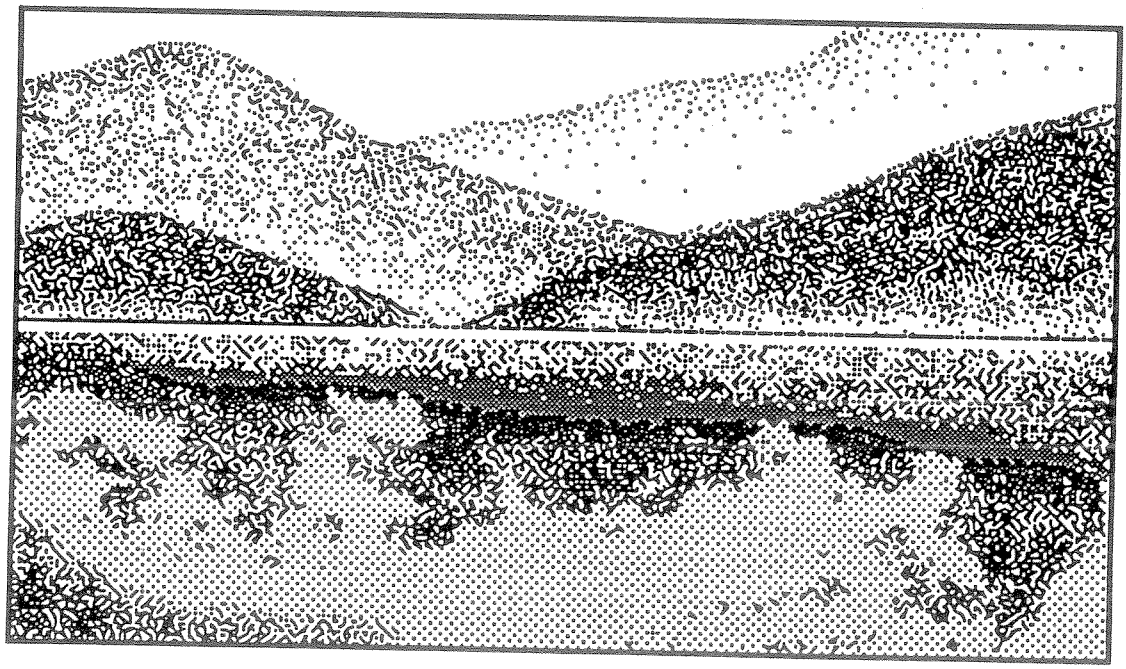
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LIST OF COMMON VERTEBRATES FOR MAJOR VEGETATION TYPES
For Contra Costa County

Habitat	Common Name	Scientific Name
1. Marsh	California slender salamander	*Batrachoseps attenuatus*
	Pacific treefrog (fresh water only)	*Hyla regilla*
	California red-legged frog (fresh water only)	*Rana aurora draytoni*
	Pacific ringneck snake (fresh water only)	*Diadophis punctatus amabilis*
	Western aquatic garter snake	*Thamnophis couchi*
	Great blue heron	*Ardea herodias*
	Great egret	*Casmerodius albus*
	Snowy egret	*Leucophoyx thula*
	White-tailed kite	*Elanus leucurus*
	Northern harrier (marsh hawk)	*Circus cyaneus*
	American coot	*Fulica americana*
	Killdeer	*Charadrius vociferus*
	Short-eared owl	*Asio flammeus*
	Long-billed marsh wren	*Telmatodytes palustris*
	Yellowthroat	*Geothlypis trichas*
	Red-winged blackbird	*Agelaius phoeniceus*
	Savannah sparrow	*Passerculus sandwichensis*
	Song sparrow	*Melospiza melodia*
	Ornate shrew	*Sorex ornatus*
	Western harvest mouse	*Reithrodontomys megalotis*
	Salt marsh harvest mouse	*R. raviventris*
	California vole	*Microtus californicus*
	Muskrat	*Ondatra zibethica*
2. Grassland	Western fence lizard	*Sceloporus occidentalis*
	Western skink	*Eumeces skiltonianus*
	Southern alligator lizard	*Gerrhonotus multicarinatus*
	Pacific gopher snake	*Pituophis melanoleucus catenifer*
	Common kingsnake	*Lampropeltis getulus*
	Western yellow-bellied racer	*Coluber constrictor mormon*
	Turkey vulture	*Cathartes aura*
	Red-tailed hawk	*Buteo jamaicensis*
	American kestrel	*Falco sparverius*
	Burrowing owl	*Speotyto cunicularia*
	Horned lark	*Eremophila alpestris*
	Loggerhead shrike	*Lanius ludovicianus*
	Western meadowlark	*Sturnella neglecta*

LIST OF COMMON VERTEBRATES FOR MAJOR VEGETATION TYPES
For Contra Costa County

Habitat	Common Name	Scientific Name
	Coyote	*Canis latrans*
	California ground squirrel	*Citellus beecheyi*
	Valley pocket gopher	*Thomomys bottae*
	Western harvest mouse	*Reithrodontomys megalotis*
	California vole	*Microtus californicus*
	Black-tailed jackrabbit	*Lepus californicus*
	Black-tailed (mule) deer	*Odocoileus hemionus columbianus*
3. Chaparral	Western fence lizard	*Sceloporus occidentalis*
	Alameda striped racer	*Masticophis lateralis euryxanthus*
	Pacific gopher snake	*Pituophis melanoleucus catenifer*
	Western long-nosed snake	*Rhinocheilus lecontei lecontei*
	Coast garter snake	*Thamnophis elegans terrestris*
	Western rattlesnake	*Crotalus viridis*
	California quail	*Lophortyx californicus*
	Scrub jay	*Aphelocoma coerulescens*
	Wrentit	*Chamaea fasciata*
	Bewick's wren	*Thryomanes bewickii*
	California thrasher	*Toxostoma redivivum*
	Brown towhee	*Pipilo fuscus*
	Gray fox	*Urocyon cinereoargenteus*
	Bobcat (not common)	*Lynx rufus*
	Piñon mouse	*Peromyscus truei*
	Dusky-footed woodrat	*Neotoma fuscipes*
	Brush rabbit	*Sylvilagus bachmani*
4. a. Riparian woodland	California newt	*Taricha torosa*
	Ensatina	*Ensatina eschscholtzi*
	California slender salamander	*Batrachoseps attenuata*
	Pacific treefrog	*Hyla regilla*
	California red-legged frog (permanent, protected streams)	*Rana aurora draytoni*
	Bullfrog	*R. catesbeiana*
	Western pond turtle	*Clemmys marmorata*
	Southern alligator lizard	*Gerrhonotus multicarinatus*
	Common garter snake	*Thamnophis sirtalis*
	Western aquatic garter snake	*T. couchi*

VEGETATION TYPES CONTINUED

Type	Subtype	Characteristic Species	
	e. Disturbed (road cuts, abandoned cultivation, waste places, disturbed areas)	*Eremocarpus setigerus*	(Turkey mullein)
		Matricaria matricaroides	(Pineapple weed)
		Brassica nigra	(Black mustard)
		Centaurea solstitialis	(Barnaby's thistle)
		Malva parviflora	(Cheeseweed)
	f. Plantation (non-native species)	*Eucalyptus* spp.	(Eucalyptus)
		Pinus radiata	(Monterey pine)
	g. Agriculture	i. Dry farm	
		ii. Irrigated	
		iii. Orchards, vineyards	
		iv. Christmas trees	
	h. Urban (including yards and parks)		

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Appendix I
EBRPD Rangeland Plant Inventory

Key to Abbreviations

Vegcode: 1st two letters of the genus, 1st two letters of the species, 1st letter of the variety (if present), number (if the letter combination is not unique).

Munz: Page number in: Munz, P.A. and D.D. Keck. 1973. A California Flora, combined ed. University of California Press, Berkeley. An "s" preceding the page number indicates an entry in the supplement section.

Family: Contemporary names (with an "aceae" ending) are used for all families. Some contemporary name spellings and the traditional equivalents are listed below:

Contemporary	Traditional	Common Name
Apiaceae	Umbelliferae	Carrot Family
Asteraceae	Compositae	Sunflower Family
Brassicaceae	Cruciferae	Mustard Family
Fabaceae	Leguminosae	Pea Family
Lamiaceae	Labiatae	Mint Family
Poaceae	Gramineae	Grass Family

Strata:
F = Fern
G = Grass or Grasslike
S = Shrub
T = Tree

E-Range: Elevation range, in feet, for each species in California (based on Munz). If the maximum elevation range is unknown, the estimate ends with the digit "1" (e.g. 5001 = estimated at 5000 ft. or higher).

Vegtype: Plant community type(s) in which the plant is usually found (based on Munz and personal observation).
C = Chaparral
E = mixed Evergreen forest
F = Freshwater marsh
G = Grassland (valley grassland in Munz)
O = Oak woodland (foothill woodland in Munz)
R = Redwood forest
S = Scrub, brush (coastal sage scrub in Munz)
W = riparian Woodland (found along drainages, not a specific community in Munz)

NI:
I = Introduced
N = Native

L (Longevity):
A = Annual
AB = Annual or Biennial
AP = Annual or Perennial
B = Biennial
P = Perennial

EBRPD Rangeland Plant Inventory

G	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range	Vegtype	NI/L
Trees										
Acer	macrophyllum		ACMA	996	BIG-LEAF MAPLE	Aceraceae	T	0 5000	OR W	NP
Acer	negundo	californicum	ACNEC	996	BOX ELDER	Aceraceae	T	0 6000	O W	NP
Aesculus	californica		AECA2	994	CALIFORNIA BUCKEYE	Anacardiaceae	T	0 4000	E O S	NP
Alnus	oregona		ALOR	900	RED ALDER	Betulaceae	T	0 500	F W	NP
Alnus	rhombifolia		ALRH	900	WHITE ALDER	Betulaceae	T	0 5000	R W	NP
Arbutus	menziesii		ARME3	415	MADRONE	Ericaceae	T	0 5000	E OR	NP
Castanopsis	chrysophylla		CACH2	901	GIANT CHINQUAPIN	Fagaceae	T	0 1500	E R	NP
Cornus	nuttallii		CONU2	1035	MOUNTAIN DOGWOOD	Cornaceae	T	- 0 6000	E W	NP
Eucalyptus	globulus		EUGL2	963	BLUE GUM	Myrtaceae	T	0 4001	E	IP
Fraxinus	latifolia		FRLA2	447	OREGON ASH	Oleaceae	T	0 3500	W	NP
Juglans	hindsii		JUHI	909	CALIFORNIA BLACK WALNUT	Juglandaceae	T	0 3500	O	NP
Juniperus	californica		JUCA3	63	CALIFORNIA JUNIPER	Cupressaceae	T	0 5000	CE O	NP
Lithocarpus	densiflorus		LIDE2	s121	TANOAK	Fagaceae	T	0 4500	E R	NP
Nicotiana	glauca		NIGL	602	TREE TOBACCO	Solanaceae	T	0 3000	GO S	IP
Olea	europaea				OLIVE	Oleaceae	T	0 3001	O	IP
Pinus	attenuata		PIAT1	54	KNOB-CONE PINE	Pinaceae	T	0 4000	R	NP
Pinus	coulteri		PICO2	55	COULTER PINE	Pinaceae	T	750 7000	O	NP
Pinus	radiata		PIRA	54	MONTEREY PINE	Pinaceae	T	0 1000	E	NP
Pinus	sabiniana		PISA2	55	DIGGER PINE	Pinaceae	T	0 4500	O	NP
Platanus	racemosa		PLRA	897	WESTERN SYCAMORE	Platanaceae	T	0 4000	R W	NP
Populus	fremontii		POFR3	910	FREMONT COTTONWOOD	Salicaceae	T	0 6500	W	NP
Populus	trichocarpa		POTR4	910	BLACK COTTONWOOD	Salicaceae	T	0 9000	W	NP
Prunus	ilicifolia		PRIL2	790	HOLLY-LEAVED CHERRY	Rosaceae	T	0 5000	C O	NP
Pseudotsuga	menziesii		PSME	57	DOUGLAS FIR	Pinaceae	T	0 5000	E R	NP
Quercus	agrifolia		QUAG	904	COAST LIVE OAK	Fagaceae	T	0 3000	E O	NP
Quercus	chasei		QUCH1	904	CHASE OAK	Fagaceae	T	1000 3000	E O	NP
Quercus	chrysolepis		QUCH2	906	CANYON or MAUL OAK	Fagaceae	T	0 6500	CE OR	NP
Quercus	douglasii		QUDO	905	BLUE OAK	Fagaceae	T	0 3500	O	NP
Quercus	dumosa		QUDU4	905	CALIFORNIA SCRUB OAK	Fagaceae	T	0 5000	C O	NP
Quercus	garryana		QUGA2	904	GARRY or OREGON OAK	Fagaceae	T	1000 5000	E R	NP
Quercus	kelloggii		QUKE	903	CALIFORNIA BLACK OAK	Fagaceae	T	500 8000	E OR	NP
Quercus	lobata		QULO	904	VALLEY OAK	Fagaceae	T	0 2000	O	NP
Quercus	morehus		QUMO	903	ORACLE OAK	Fagaceae	T	0 5000	E O	NP
Quercus	wislizenii		QUWI	903	INTERIOR LIVE OAK	Fagaceae	T	0 5000	C O	NP
Salix	babylonica		SABA	s121	WEEPING WILLOW	Salicaceae	T	0 3001	W	IP
Salix	lasiandra		SALA5	917	YELLOW WILLOW	Salicaceae	T	0 8000	W	NP
Sequoia	sempervirens		SESE2	57	COAST REDWOOD	Taxodiaceae	T	0 2000	R	NP
Torreya	californica		TOCA	65	CALIFORNIA NUTMEG	Taxaceae	T	0 4500	E	NP
Umbellularia	californica		UMCA1	77	BAY LAUREL	Lauraceae	T	0 5000	E OR	NP
Shrubs										
Adenostoma	fasciculatum		ADFA	778	CHAMISE	Rosaceae	S	0 5000	C GO S	NP
Aesculus	californica		AECA1	994	CALIFORNIA BUCKEYE	Sapindaceae	S	0 4000	E O S	NP
Amelanchier	pallida		AMPA2	793	SERVICE BERRY	Rosaceae	S	0 11000	E O S	NP
Amorpha	californica	napensis	AMCAN	852	FALSE INDIGO	Fabaceae	S	0 7500	C	NP
Arctostaphylos	andersonii	pallida	ARANP	427	ALAMEDA MANZANITA	Ericaceae	S	0 2200	C	NP
Arctostaphylos	auriculata		ARAU	426	MOUNT DIABLO MANZANITA	Ericaceae	S	500 2000	C	NP
Arctostaphylos	crustacea		ARCR	429	BRITTLELEAF MANZANITA	Ericaceae	S	0 3400	C	NP
Arctostaphylos	glandulosa		ARGL4	428	EASTWOOD MANZANITA	Ericaceae	S	1000 6000	CE	NP
Arctostaphylos	glandulosa	cushingiana	ARGLC3	428	CUSHING MANZANITA	Ericaceae	S	0 2500	C	NP
Arctostaphylos	glauca		ARGL5	424	GREAT-BERRIED MANZANITA	Ericaceae	S	0 4500	C	NP
Arctostaphylos	manzanita		ARMA3	422	PARRY MANZANITA	Ericaceae	S	300 4000	C O	NP
Aristolochia	californica		ARCA6	966	DUTCHMAN'S PIPE	Aristolochiaceae	S	0 1500	CE O	NP
Artemisia	californica		ARCA7	1236	CALIFORNIA SAGEBRUSH	Asteraceae	S	0 2500	E S	NP
Baccharis	douglasii		BADO	1225	SALT MARSH BACCHARIS	Asteraceae	S	0 1500	W	NP
Baccharis	pilularis	consanguinea	BAPIC	1226	COYOTE BRUSH	Asteraceae	S	0 2000	CE GORS	NP
Baccharis	viminea		BAVI	1226	MULE FAT	Asteraceae	S	0 1500	O S	NP
Berberis	nervosa		BENE1	109	DWARF OREGON GRAPE	Berberidaceae	S	0 6000	R	NP
Berberis	pinnata		BEPI1	109	CALIFORNIA BARBERRY	Berberidaceae	S	0 4000	E R	NP
Brickellia	californica		BRCA5	1270	SWEET-SCENTED BRICKELLIA	Asteraceae	S	0 8000	C S	NP
Castanopsis	chrysophylla	minor	CACHM	901	GOLDEN CHINQUAPIN	Fagaceae	S	1000 6000	CE	NP
Castilleja	foliolosa		CAFO2	671	WOOLLY PAINTED CUP	Scrophulariaceae	S	0 5000	CE GO S	NP
Ceanothus	cuneatus		CECU2	982	BUCK BRUSH	Rhamnaceae	S	0 6000	C	NP
Ceanothus	sorediatus		CESO3	977	JIM BRUSH	Rhamnaceae	S	0 3500	CE O	NP
Ceanothus	thyrsiflorus		CETH	979	BLUE BRUSH	Rhamnaceae	S	0 2000	CE RS	NP
Cercocarpus	betuloides		CEBE2	781	WESTERN MT. MAHOGANY	Rosaceae	S	0 6000	C O	NP
Cornus	glabrata		COGL	1034	BROWN DOGWOOD	Cornaceae	S	0 5000	W	NP
Cornus	occidentalis		COOC2	1035	CREEK DOGWOOD	Cornaceae	S	0 8000	E O SW	NP
Corylus	cornuta	californica	COCOC	899	CALIFORNIA HAZELNUT	Betulaceae	S	0 7000	E ORS	NP
Cytisus	monspessulanus		CYMO2	830	FRENCH BROOM	Fabaceae	S	0 2001	CE GO S	IP
Cytisus	scoparius		CYSC2	830	SCOTCH BROOM	Fabaceae	S	0 2001	CE GO S	IP
Diplacus	aurantiacus		DIAU1	624	BUSH MONKEY-FLOWER	Scrophulariaceae	S	0 3000	CE RS	NP

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range		Vegtype			NI/L
Dirca	occidentalis		DIOC3	987	WESTERN LEATHERWOOD	Thymelaeaceae	S	0	1500	CE			NP
Eriodictyon	californicum		ERCA6	548	YERBA SANTA	Hydrophyllaceae	S	0	5500	CE	OR		NP
Eriophyllum	confertiflorum		ERCO7	1149	GOLDEN YARROW	Asteraceae	S	0	8000	C		S	NP
Eriophyllum	jepsonii		ERJE	1148	JEPSON ERIOPHYLLUM	Asteraceae	S	1000	3500		O		NP
Forestiera	neomexicana		FONE1	448	DESERT OLIVE	Oleaceae	S	0	6700	C	O	S	NP
Fraxinus	dipetala		FRDI	447	FOOTHILL ASH	Oleaceae	S	0	3500	C	O		NP
Garrya	elliptica		GAEL	1037	SILK TASSEL BUSH	Garryaceae	S	0	2000	CE		S	NP
Garrya	fremontii		GAFR	1036	BEAR BUSH	Garryaceae	S	0	7500	CE			NP
Gaultheria	shallon		GASH	415	SALAL	Ericaceae	S	0	2500	E	RS		NP
Gutierrezia	californica		GUCA	1167	CALIFORNIA SNAKEWEED	Asteraceae	S	0	1000	C	GO		NP
Haplopappus	arborescens		HAAR	1183	GOLDEN FLEECE	Asteraceae	S	300	4000	C	O		NP
Haplopappus	linearifolius		HALI	1180		Asteraceae	S	0	6000	C		S	NP
Helianthemum	scoparium	vulgare	HESCV	173	RUSH-ROSE	Cistaceae	S	0	4000	C			NP
Helianthus	gracilentus		HEGR3	1089	CHAPARRAL SUNFLOWER e	Asteraceae	S	200	6000	C			NP
Heteromeles	arbutifolia		HEAR2	794	CHRISTMAS BERRY or TOYON	Rosaceae	S	0	4000	CE	O	S	NP
Holodiscus	discolor		HODI	759	CREAM BUSH or OCEAN SPRAY	Rosaceae	S	0	4500	CE	RS		NP
Lepechinia	calycina		LECA3	707	PITCHER SAGE	Lamiaceae	S	0	3000	C	O		NP
Lonicera	hispidula	vacillans	LOHIV	1051	CALIFORNIA HONEYSUCKLE	Caprifoliaceae	S	0	2500	E	RS		NP
Lonicera	interrupta		LOIN3	1051	CHAPPARAL HONEYSUCKLE	Caprifoliaceae	S	1000	6000	C	O		NP
Lonicera	involucrata	ledebourii	LOINL	1050	TWIN-BERRY	Caprifoliaceae	S	0	1000			S	NP
Lonicera	subspicata	johnstonii	LOSUJ	1051	MORONEL or S. HONEYSUCKLE	Caprifoliaceae	S	0	3000	C			NP
Lupinus	albifrons		LUAL3	823	SILVER BUSH LUPINE	Fabaceae	S	0	5000	CE		S	NP
Malacothamnus	fasciculatus		MAFA2	126	MESA MALLOW	Malvaceae	S	0	2500	C		S	NP
Malacothamnus	fremontii		MAFR	124	WHITE COAT MALLOW	Malvaceae	S	200	3500	C	O		NP
Myrica	californica		MYCA	908	CALIFORNIA WAX-MYRTLE	Myricaceae	S	0	500		RS		NP
Nicotiana	glauca		NIGL	602	TREE TOBACCO	Solanaceae	S	0	3000		GO	S	IP
Olea	europaea				OLIVE	Oleaceae	S	0	3001		O		IP
Osmaronia	cerasiformis		OSCE	791	OSO BERRY	Rosaceae	S	0	5600	CE	RS		NP
Penstemon	corymbosus		PECO4	641	ROCK PENSTEMON	Scrophulariaceae	S	0	5000	E	R		NP
Physocarpus	capitatus		PHCA8	757	PACIFIC NINEBARK	Rosaceae	S	0	4500	E	OR	W	NP
Pickeringia	montana		PIMO1	803	CHAPARRAL PEA	Fabaceae	S	0	5000	CE			NP
Prunus	emarginata		PREM	789	BITTER CHERRY	Rosaceae	S	0	4000	C			NP
Prunus	ilicifolia		PRIL1	790	HOLLY-LEAVED CHERRY	Rosaceae	S	0	5000	C	O		NP
Prunus	subcordata		PRSU2	789	SIERRA PLUM	Rosaceae	S	0	6000	E			NP
Prunus	virginiana	demissa	PRVID	790	WESTERN CHOKE-CHERRY	Rosaceae	S	0	8200	C	O		NP
Ptelea	crenulata		PTCR	992	HOP TREE	Rutaceae	S	0	3500		O	S	NP
Quercus	dumosa		QUDU2	905	CALIFORNIA SCRUB OAK	Fagaceae	S	0	5000	C	O		NP
Quercus	durata		QUDU1	906	LEATHER OAK	Fagaceae	S	0	5000	C	O		NP
Quercus	wislizenii	frutescens	QUWIF	904	SHRUB INTERIOR LIVE OAK	Fagaceae	S	500	5001	C			NP
Rhamnus	californica		RHCA2	972	CALIFORNIA COFFEE-BERRY	Rhamnaceae	S	0	3500	CE	RS		NP
Rhamnus	crocea		RHCR	972	RED-BERRY	Rhamnaceae	S	0	3000	CE	O	S	NP
Rhamnus	crocea	ilicifolia	RHCRI	971	RED-BERRY	Rhamnaceae	S	0	5000	CE	O		NP
Rhus	diversiloba		RHDI	998	POISON OAK	Anacardiaceae	S	0	5000		GORSW		NP
Rhus	trilobata	malacophylla	RHTRM	998	SQUAW BUSH	Anacardiaceae	S	0	3500	C	O	S	NP
Rhus	trilobata	quinata	RHTRQ	998	SQUAW BUSH	Anacardiaceae	S	0	3500	C	O	S	NP
Ribes	californicum		RICA1	752	HILL GOOSEBERRY	Saxifragaceae	S	0	2500	CE	OR		NP
Ribes	malvaceum		RIMA1	749	CALIFORNIA BLACK CURRANT	Saxifragaceae	S	0	2500	C	O		NP
Ribes	menziesii		RIME	752	CANYON GOOSEBERRY	Saxifragaceae	S	0	1000	E	R		NP
Ribes	sanguineum	glutinosum	RISAG	749	RED-FLOWERING CURRANT	Saxifragaceae	S	0	2000	CE	OR		NP
Rosa	californica		ROCA1	787	CALIFORNIA ROSE	Rosaceae	S	0	6000	CE	ORS		NP
Rosa	gymnocarpa		ROGY	788	WOOD ROSE	Rosaceae	S	0	6000	CE	ORS		NP
Rosa	spithamea	sonomensis	ROSPS	787	SONOMA ROSE	Rosaceae	S	0	4000	CE			NP
Rubus	parviflorus		RUPA	785	THIMBLE-BERRY	Rosaceae	S	0	8000	E	R		NP
Rubus	procerus		RUPR	784	HIMALAYA-BERRY	Rosaceae	S	0	4001	E	RS		IP
Rubus	ursinus		RUUR	784	CALIFORNIA BLACKBERRY	Rosaceae	S	0	3000	E	RS		NP
Rubus	vitifolius		RUVI2	783	COAST CALIF. BLACKBERRY	Rosaceae	S	0	4000	E	GO	W	NP
Salix	coulteri		SACO3	917	COULTER WILLOW	Salicaceae	S	0	2000	E	R	W	NP
Salix	hindsiana		SAHI2	913	SANDBAR WILLOW	Salicaceae	S	0	3000	E	ORSW		NP
Salix	laevigata		SALA4	913	RED WILLOW	Salicaceae	S	0	5000	E	RSW		NP
Salix	lasiolepis		SALA3	915	ARROYO WILLOW	Salicaceae	S	0	7000	E	ORSW		NP
Salvia	mellifera		SAME4	705	BLACK SAGE	Lamiaceae	S	0	2000	C		S	NP
Sambucus	caerulea		SACA4	1047	BLUE ELDERBERRY	Caprifoliaceae	S	0	10000	CE	O	S	NP
Sambucus	callicarpa		SACA3	1047	PACIFIC RED ELDERBERRY	Caprifoliaceae	S	0	1000	E	R	W	NP
Solanum	umbelliferum		SOUM	598	BLUE WITCH	Solanaceae	S	0	2500	CE		S	NP
Solanum	umbelliferum	incanum	SOUMI	598	BLUE WITCH	Solanaceae	S	0	4500	C	GO		NP
Symphoricarpos	mollis		SYMO	1049	CREEPING SNOWBERRY	Caprifoliaceae	S	0	5000	CE	O		NP
Symphoricarpos	rivularis		SYRI	1049	COMMON SNOWBERRY	Caprifoliaceae	S	0	4000	E	ORS		NP
Umbellularia	californica		UMCA2	77	BAY LAUREL	Lauraceae	S	0	5000	E	OR		NP
Vaccinium	ovatum		VAOV	430	CALIFORNIA HUCKLEBERRY	Ericaceae	S	0	2500	E	R		NP
Viburnum	ellipticum		VIEL	1048	WESTERN VIBURNUM	Caprifoliaceae	S	1000	4500	C			NP
Vitis	californica		VICA3	969	CALIFORNIA GRAPE	Vitaceae	S	0	4000	E	O		NP
Herbs													
Achillea	borealis	californica	ACBOC	1229	COMMON YARROW	Asteraceae	H	0	2500	E	GORS		NP
Achillea	millefolium		ACMI	1228	MILFOIL	Asteraceae	H	0	5001		GO	S	IP
Achyrachaena	mollis		ACMO	1107	BLOW-WIVES	Asteraceae	H	0	1000		GO		NA
Agoseris	grandiflora		AGGR1	1293		Asteraceae	H	0	6200		GO		NP
Agoseris	heterophylla		AGHE	1292		Asteraceae	H	0	7500		GO		NA
Agoseris	retrorsa		AGRE2	1293		Asteraceae	H	2500	8000	C	GO		NP

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range		Vegtype		NI/L
Alchemilla	occidentalis		ALOC1	777	WESTERN LADY'S MANTLE	Rosaceae	H	0	2000	E	GO	NA
Alisma	triviale		ALTR1	1314	WATER PLANTAIN	Alismataceae	H	0	5000		W	NP
Allium	acuminatum		ALAC	1378	HOOKER ONION	Liliaceae	H	0	6000	C		NP
Allium	falcifolium		ALFA	1372	SICKLE-LEAVED ONION	Liliaceae	H	500	7000	CE	O	NP
Allium	serratum		ALSE	1374	SERRATUM ONION	Liliaceae	H	0	3000		GO	NP
Allium	unifolium		ALUN	1373	COLONIAL ONION	Liliaceae	H	0	3500	CE		NP
Allophyllum	gilicoides		ALGI	672		Polemoniaceae	H	0	6000	C	GO	NA
Amaranthus	albus		AMAL	387	TUMBLEWEED	Amaranthaceae	H	0	5001	CE	GO S	IA
Amaranthus	californicus		AMCA1	387	CALIFORNIA AMARANTH	Amaranthaceae	H	0	8000	C	GO	NA
Amaranthus	retroflexus		AMRE	386	ROUGH PIGWEED	Amaranthaceae	H	0	5001	CE	GO S	IA
Amsinckia	intermedia		AMIN	589	COMMON FIDDLENECK	Boraginaceae	H	0	5000		GO	NA
Amsinckia	tessellata		AMTE	588	COBBLESTONE FIDDLENECK	Boraginaceae	H	0	6000		GO	NA
Anagallis	arvensis		ANAR2	404	SCARLET PIMPERNEL	Primulaceae	H	0	4001	CE	GORS	IA
Anaphalis	margaritacea		ANMA1	1263	PEARLY EVERLASTING	Asteraceae	H	0	8500	E	RS	IP
Androsace	elongata	acuta	ANEL A	399		Primulaceae	H	0	4000	C	GO S	NA
Anemopsis	californica		ANCA	114	YERBA MANSA	Saururaceae	H	0	6500		W	NP
Angelica	tomentosa		ANTO	1028	WOOD ANGELICA	Apiaceae	H	0	7000	C		NP
Anthemis	cotula		ANCO2	1228	MAYWEED	Asteraceae	H	0	5001	CE	GORS	IA
Anthriscus	neglecta	scandix	ANNES	s138	BUR CHERVIL	Apiaceae	H	0	5001	CE	GORS	IA
Antirrhinum	kelloggii		ANKE	652	HOOKER SNAPDRAGON	Scrophulariaceae	H	0	2000	C	S	NA
Antirrhinum	vexillo-calyculatum		ANVE	651	WIRY SNAPDRAGON	Scrophulariaceae	H	0	4000	C	S	NA
Apiastrum	angustifolium		APAN1	1006	MOCK PARSLEY	Apiaceae	H	0	3000	C	GO S	NA
Apocynum	cannabinum	glaberrimum	APCAG	451	INDIAN HEMP	Apocynaceae	H	0	5000	CE	GORS	NP
Apocynum	pumilum		APPU	451	MOUNTAIN HEMP	Apocynaceae	H	2500	5500	E	RS	NP
Aquilegia	eximia		AQEX	105	STREAM COLUMBINE	Ranunculaceae	H	0	6000		W	NP
Aquilegia	formosa	truncata	AQFOT	105	CRIMSON COLUMBINE	Ranunculaceae	H	0	8000	E	RS	NP
Arabis	breweri		ARBR	262	BREWER ROCK CRESS	Brassicaceae	H	1500	7400		O	NP
Arabis	glabra		ARGL2	258	TOWER MUSTARD	Brassicaceae	H	0	7000	CE	GORS	NP
Aralia	californica		ARCA2	1000	ELK CLOVER	Araliaceae	H	0	5000	E	ORS	NP
Arceuthobium	campylopodum		ARCA10	990	PINE MISTLETOE	Viscaceae	H	0	5001	E	O	NP
Arenaria	douglasii		ARDO2	279	DOUGLAS SANDWORT	Caryophyllaceae	H	0	7000	C	GO	NA
Arenaria	macrophylla		ARMA1	282		Caryophyllaceae	H	15	6500	E		NP
Argemone	munita	rotundata	ARMUR2	200	THISTLE-POPPY / CHICALOTE	Papaveraceae	H	12	3200	C		NP
Arnica	discoidea		ARDI3	1243	COAST ARNICA	Asteraceae	H	1500	6000	E		NP
Arnica	discoidea	alata	ARDIA	1243	COAST ARNICA	Asteraceae	H	1500	6000	E		NP
Arnica	discoidea	eradiata	ARDIE	1243	COAST ARNICA	Asteraceae	H	1500	6000	E		NP
Artemisia	douglasiana		ARDO3	1237	CALIFORNIA MUGWORT	Asteraceae	H	0	6000	CE	ORS	NP
Asclepias	californica		ASCA3	455	ROUND-HOOD MILKWEED	Asclepiadaceae	H	0	7500	C	O	NP
Asclepias	californica	greenei	ASCAG	455	ROUND-HOOD MILKWEED	Asclepiadaceae	H	0	3500	C	O	NP
Asclepias	fascicularis		ASFA	456	NARROW-LEAF MILKWEED	Asclepiadaceae	H	0	7000	C	GO S	NP
Asclepias	speciosa		ASSP1	455	SHOWY MILKWEED	Asclepiadaceae	H	0	6000	E	O	NP
Aster	radulinus		ASRA1	1197	BROAD-LEAF ASTER	Asteraceae	H	300	5000	E	O S	NP
Astragalus	asymmetricus		ASAS2	878	ASYMMETRICAL LOCO	Fabaceae	H	200	2500		GO	NP
Astragalus	gambelianus		ASGA	864	LITTLE BILL LOCO	Fabaceae	H	0	4000		GO S	NA
Athysanus	pusillus		ATPU1	253	SANDWEED	Brassicaceae	H	0	5000	C	GO S	NA
Baccharis	douglasii		BADO	1225		Asteraceae	H	0	1500		W	NP
Barbarea	orthoceras	dolichocarpa	BAORD	238	WINTER CRESS	Brassicaceae	H	1001	11000		W	NP
Bellardia	trixago		BETR	657		Scrophulariaceae	H	0	4001	E	GO S	IA
Berula	erecta		BEER	1011	CUT-LEAVED WATER PARSNIP	Apiaceae	H	0	8000		W	NP
Blennosperma	nanum		BLNA	1159	COMMON BLENNOSPERMA	Asteraceae	H	0	1500		GO	NA
Boisduvalia	densiflora		BODE	933		Onagraceae	H	0	8500		W	NA
Boisduvalia	glabella		BOGL	934		Onagraceae	H	0	5000		W	NA
Boisduvalia	stricta		BOST1	934		Onagraceae	H	0	8500		W	NA
Bowlesia	incana		BOIN	1004	BOWLESIA	Apiaceae	H	0	2500		O S	NA
Boykinia	elata		BOEL	732	COAST BOYKINIA	Saxifragaceae	H	0	5000	E	RSW	NP
Brassica	campestris		BRCA3	236	COMMON YELLOW MUSTARD	Brassicaceae	H	0	5001	CE	GORS	IA
Brassica	geniculata		BRGE	236	LATE MUSTARD	Brassicaceae	H	0	5001		GO	IBP
Brassica	kaber	pinnatifida	BRKAP	237	CHARLOCK	Brassicaceae	H	0	5001	CE	GORS	IA
Brassica	nigra		BRNI	236	BLACK MUSTARD	Brassicaceae	H	0	5001	CE	GORS	IA
Brodiaea	elegans		BREL	1383	HARVEST BRODIAEA	Liliaceae	H	0	7000		GO	NP
Brodiaea	hyacinthina		BRHY	1383	WHITE BRODIAEA	Liliaceae	H	0	5500		GO W	NP
Brodiaea	laxa		BRLA2	1381	ITHURIEL'S SPEAR	Liliaceae	H	0	4600	CE	GO	NP
Brodiaea	pulchella		BRPU	1385	BLUE DICKS	Liliaceae	H	0	5001	E	GO S	NP
Calandrinia	breweri		CABR7	299		Portulacaceae	H	0	3500	C	S	NA
Calandrinia	ciliata	menziesii	CACIM	299	RED MAIDS	Portulacaceae	H	0	6000		GO	NA
Calochortus	albus		CAAL4	1346	GLOBE LILY	Liliaceae	H	0	5000	C	O	NP
Calochortus	luteus		CALU3	1351	YELLOW MARIPOSA LILY	Liliaceae	H	0	2000	E	GO	NP
Calochortus	pulchellus		CAPU2	1347	FAIRY LANTERN	Liliaceae	H	700	4000	C	O	NP
Calochortus	splendens		CASP4	1350	LILAC MARIPOSA	Liliaceae	H	0	6000	C	GO	NP
Calochortus	superbus		CASU4	1351	SUPERB MARIPOSA LILY	Liliaceae	H	0	5000		GO	NP
Calochortus	umbellatus		CAUM1	1348	STAR TULIP	Liliaceae	H	1000	2200	CE		NP
Calochortus	venustus		CAVE4	1350	BUTTERFLY TULIP	Liliaceae	H	1000	8000		GO	NP
Calycadenia	truncata		CATR4	1126	ROSIN WEED	Asteraceae	N	0	3800	C	O	NA
Calystegia	malacophylla		CAMA	s85	WOOLLY MORNING-GLORY	Convolvulaceae	H	0	2000	C		NP
Calystegia	purpurata		CAPU3	s85	BRUSH MORNING-GLORY	Convolvulaceae	H	0	1000	C	S	NP
Calystegia	subacaulis		CASU6	s85	SHORT-STEM MORNING-GLORY	Convolvulaceae	H	0	1500		O S	NP
Campanula	exigua		CAEX4	1062	RATTAN BEDFLOWER	Campanulaceae	H	2000	4000	C		NA
Campanula	prenanthoides		CAPR6	1063	CALIFORNIA HAREBELL	Campanulaceae	H	0	6000	E	R	NP
Capsella	bursa-pastoris		CABU3	247	SHEPHERD'S PURSE	Brassicaceae	H	0	7000	CE	GO S	IA
Cardamine	oligosperma		CAOL	242	HILL CRESS	Brassicaceae	H	0	3000	C	O S	NA
Carduus	pycnocephalus		CAPY2	1280	ITALIAN THISTLE	Asteraceae	N	0	4001	CE	GO S	IA

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Carduus	tenuiflorus		CATE4	1281	SLENDER THISTLE	Asteraceae	H	0 4001	CE GO S	IA
Castilleja	affinis		CAAF	671	INDIAN PAINT BRUSH	Scrophulariaceae	H	0 7001	CE O S	NP
Castilleja	foliolosa		CAFO2	671	WOOLLY PAINTED CUP	Scrophulariaceae	H	0 5000	CE GO S	NP
Caucalis	microcarpa		CAMI6	1007	BUR-PARSLEY	Apiaceae	H	0 5000	CE ORS	NA
Centaurea	calcitrapa		CECA1	1283	PURPLE STAR THISTLE	Asteraceae	H	0 4001	E GO S	IAB
Centaurea	melitensis		CEME1	1283	MAPA THISTLE	Asteraceae	H	0 5001	CE GO S	IA
Centaurea	solstitialis		CESO1	1283	YELLOW STAR THISTLE	Asteraceae	H	0 5001	CE GO S	IA
Centaurium	floribundum		CEFL1	439	JUNE CENTAURY	Gentianaceae	H	0 1600	GO W	NA
Cerastium	viscosum		CEVI	277	MOUSE-EAR CHICKWEED	Caryophyllaceae	H	0 4001	CE GO S	IA
Chaetopappa	alsinoides		CHAL2	1172		Asteraceae	H	0 1000	G S	NA
Chaetopappa	exilis		CHEX	1172		Asteraceae	H	100 1500	GO	NA
Chenopodium	album		CHAL3	372	WHITE PIGWEED	Chenopodiaceae	H	0 6000	CE GORS	IA
Chenopodium	californicum		CHCA2	370	CALIFORNIA SOAP PLANT	Chenopodiaceae	H	0 5000	C GO	NP
Chlorogalum	pomeridianum		CHPO1	1329	SOAP ROOT	Liliaceae	H	0 5000	GO S	NP
Chorizanthe	membranacea		CHME1	325	MEMBRANOUS CHORIZANTHE	Polygonaceae	H	0 4500	C GO	NA
Chorizanthe	uniaristata		CHUN	328		Polygonaceae	H	0 4000	C GO	NA
Chrysopsis	villosa	echioides	CHVIE	1169	HAIRY GOLDEN ASTER	Asteraceae	H	0 2000	GO S	NP
Cirsium	breweri		CIBR2	1278	SWAMP THISTLE	Asteraceae	H	0 5000	W	NB
Cirsium	californicum		CICA1	1280	CALIFORNIA THISTLE	Asteraceae	H	0 7000	C O S	NB
Cirsium	proteanum		CIPR	s166	VENUS THISTLE	Asteraceae	H	0 10000	CE GO S	NAB
Cirsium	vulgare		CIVU	1276	BULL THISTLE	Asteraceae	H	0 5000	CE GORS	IB
Clarkia	biloba		CLBI	941	MULE-EAR CLARKIA	Onagraceae	H	0 4000	GO	NA
Clarkia	concinna		CLCO	943	RED RIBBONS	Onagraceae	H	0 4000	E O	NA
Clarkia	gracilis		CLGR	938	FAREWELL-TO-SPRING	Onagraceae	H	0 5000	E O	NA
Clarkia	purpurea		CLPU	940	WINECUP CLARKIA	Onagraceae	H	0 1000	GO S	NA
Clarkia	purpurea	quadrivulnera	CLPUQ	940	FOUR-SPOT CLARKIA	Onagraceae	H	0 6000	CE GO S	NA
Clarkia	rubicunda		CLRU	937	RED-BASED GODETIA	Onagraceae	H	0 4001	E O S	NA
Clarkia	unguiculata		CLUN1	942	CANYON CLARKIA	Onagraceae	H	0 5000	C GO	NA
Clematis	lasiantha		CLLA3	103	OLD MAN'S BEARD	Ranunculaceae	H	0 6000	C O W	NP
Clematis	ligusticifolia		CLLI2	103	WESTERN VIRGIN'S BOWER	Ranunculaceae	H	0 7000	CE O SW	NP
Clintonia	andrewsiana		CLAN	1333	RED-FLOWERING CLINTONIA	Liliaceae	H	0 2000	R	NP
Collinsia	bartsiifolia		COBA	s98	WHITE CHINESE HOUSES	Scrophulariaceae	H	0 2000	GO	NA
Collinsia	heterophylla		COHE1	644	CHINESE HOUSES	Scrophulariaceae	H	0 2500	CE GO S	NA
Collinsia	sparsiflora		COSP	646	FEW-FLOWERED COLLINSIA	Scrophulariaceae	H	0 3000	C GO	NA
Collinsia	tinctoria		COTI1	645	IODINE COLLINSIA	Scrophulariaceae	H	2000 7500	C O	NA
Conium	maculatum		COMA1	1011	POISON HEMLOCK	Apiaceae	H	0 5000	E GO S	IB
Convolvulus	arvensis		COAR2	s83	BINDWEED	Convolvulaceae	H	0 5000	E GO S	IP
Conyza	canadensis		COCA2	1224	HORSEWEED	Asteraceae	H	0 4001	CE GORS	IA
Cordylanthus	pilosus		COPI2	677	BIRD'S BEAK	Scrophulariaceae	H	0 1000	CE	NA
Cotula	coronopifolia		COCO4	1234	BRASS BUTTONS	Asteraceae	H	0 5001	F W	IP
Cryptantha	clevelandii		CRCL	574		Boraginaceae	H	0 2500	C S	NA
Cryptantha	corollata		CRCO2	569		Boraginaceae	H	0 4500	GO	NA
Cryptantha	flaccida		CRFL1	572		Boraginaceae	H	0 6000	CE GO S	NA
Cryptantha	intermedia		CRIN4	569	COMMON CRYPTANTHA	Boraginaceae	H	0 6000	C O S	NA
Cryptantha	micromeres		CRMI2	568		Boraginaceae	H	0 2000	C S	NA
Cryptantha	microstachys		CRMI3	574		Boraginaceae	H	0 4000	C O	NA
Cryptantha	muricata		CRMU2	570		Boraginaceae	H	0 8000	CE GO S	NA
Cryptantha	nevadensis	rigida	CRNER	570		Boraginaceae	H	0 6000	C GO S	NA
Cryptantha	torreyana	pumila	CRTOP	573		Boraginaceae	H	1500 7500	CE O	NA
Cuscuta	subinclusa		CUSU2	467	COMMON DODDER	Cuscutaceae	H	0 5000	CE O S	NP
Cynara	cardunculus		CYCA1	1273	CARDOON/ARTICHOKE THISTLE	Asteraceae	H	0 3000	GO	IP
Cynoglossum	grande		CYGR	557	HOUND'S TONGUE	Boraginaceae	H	0 5000	E O	NP
Cypselea	humifusa		CYHU2	307		Aizoaceae	H	1001 3001	W	NP
Datisca	glomerata		DAGL2	177	DURANGO ROOT	Datiscaceae	H	0 6500	CE O	NP
Daucus	carota		DACA3	1009	WILD CARROT	Apiaceae	H	0 5001	CE GO S	IB
Daucus	pusillus		DAPU	1009	RATTLESNAKE WEED	Apiaceae	H	0 5000	CE O S	NA
Delphinium	californicum		DECA2	87	COAST LARKSPUR	Ranunculaceae	H	0 2000	E	NP
Delphinium	decorum		DEDE1	84	WOODLAND LARKSPUR	Ranunculaceae	H	0 2000	G S	NP
Delphinium	hesperium		DEHE	88	WESTERN LARKSPUR	Ranunculaceae	H	0 2500	E GO	NP
Delphinium	nudicaule		DENU1	86	RED LARKSPUR	Ranunculaceae	H	0 6500	CE O S	NP
Delphinium	variegatum		DEVA	90	ROYAL LARKSPUR	Ranunculaceae	H	0 5001	GO	NP
Dentaria	californica		DECA4	243	MILK MAIDS	Brassicaceae	H	0 2500	E ORS	NP
Dicentra	chrysantha		DICH	202	GOLDEN EAR-DROPS	Fumariaceae	H	0 5000	C O	NP
Dicentra	formosa		DIFO	203	BLEEDING HEART	Fumariaceae	H	0 7000	E OR W	NP
Dipsacus	sylvestris		DISY	1057	TEASEL	Dipsacaceae	H	0 2001	GO	IB
Disporum	hookeri		DIHO2	1332	FAIRY BELLS	Liliaceae	H	0 2000	E R	NP
Disporum	smithii		DISM	1332	LARGE-FLOWERED FAIRY BELL	Liliaceae	H	0 2000	E R	NP
Dodecatheon	hendersonii		DOHE	401	SHOOTING STAR	Primulaceae	H	0 6700	E GO	NP
Dudleya	cymosa		DUCY	722	LIVE-FOREVER	Crassulaceae	H	0 9000	C O	NP
Dudleya	cymosa	setchellii	DUCYS	723	LIVE-FOREVER	Crassulaceae	H	0 5000	C O	NP
Elatine	californica		ELCA3	273	CALIFONIA WATER-WORT	Elatinaceae	H	0 5000	W	NA
Emmenanthe	penduliflora		EMPE	544	WHISPERING BELLS	Hydrophyllaceae	H	0 5000	C S	NP
Epilobium	adenocaulon		EPAD	932	CALIFORNIA COTTONWEED	Onagraceae	H	0 11000	W	NP
Epilobium	minutum		EPMI	930	CHAPARRAL COTTONWEED	Onagraceae	H	0 5000	CE O	NA
Epilobium	paniculatum		EPPA	929	SUMMER COTTONWEED	Onagraceae	H	0 7500	CE GO S	NA
Epipactis	gigantea		EPGI	1399	STREAM ORCHIS	Orchidaceae	H	0 7500	W	NP
Eremocarpus	setigerus		ERSE	162	TURKEY MULLEIN	Euphorbiaceae	H	0 2500	GO S	NA
Erigeron	foliosus		ERFO	1217	CALIFORNIA FLEABANE	Asteraceae	H	0 5000	C GO	NP
Erigeron	petrophilus		ERPE2	1218	INORNATE FLEABANE	Asteraceae	H	1500 7500	CE O	NP
Erigeron	philadelphicus		ERPH	1211	SKEVISH	Asteraceae	H	0 4000	G	NB
Eriogonum	caninum		ERCA2	345	DOG BUCKWHEAT	Polygonaceae	H	1000 2200	G	NA

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Eriogonum	gracile		ERGR3	344		Polygonaceae	H	0 5000	C O S	NA
Eriogonum	inerme		ERIN1	341		Polygonaceae	H	0 7000	C O	NA
Eriogonum	latifolium	nudum	ERLAN	352	TIBINAGUA/NUDE BUCKWHEAT	Polygonaceae	H	0 8000	CE O S	NP
Eriogonum	truncatum		ERTR3	346		Polygonaceae	H	1 1500	C	NA
Eriogonum	umbellatum	stellatum	ERUMS1	344	SULFER FLOWER	Polygonaceae	H	3000 7500	E GO	NP
Eriophyllum	lanatum	achillaeoides	ERLAA2	1146	OREGON SUNSHINE	Asteraceae	H	0 10000	CE O	NP
Erodium	botrys		ERBO	144	GRAPE STORK'S BILL	Geraniaceae	H	0 4001	CE GORS	IA
Erodium	cicutarium		ERCI2	145	RED-STEM FILAREE	Geraniaceae	H	0 6000	CE GORS	IA
Erodium	macrophyllum		ERMA1	144	LARGE-LEAF FILAREE	Geraniaceae	H	0 3500	GO	NA
Erodium	malacoides		ERMA2	144		Geraniaceae	H	0 4001	C GO	IA
Erodium	moschatum		ERMO4	144	WHITE-STEM FILAREE	Geraniaceae	H	0 4001	CE GORS	IA
Erodium	obtusiplicatum		EROB	144	FILAREE	Geraniaceae	H	0 4001	GO	IA
Eryngium	aristulatum		ERAR5	1033	COYOTE-THISTLE	Apiaceae	H	0 3000	W	NP
Eryngium	vaseyi	vallicola	ERVAV	1033	MINERS' ERYNGO	Apiaceae	H	0 1800	G W	NP
Erysimum	capitatum		ERCA3	268	WESTERN WALL FLOWER	Brassicaceae	H	0 8000	CE GO	NB
Eschscholzia	californica	crocea	ESCAC	198	CALIFORNIA POPPY	Papaveraceae	H	0 6500	CE GO	NP
Eucrypta	chrysanthemifolia		EUCH	519	COAST ELLISIA	Hydrophyllaceae	H	0 3000	C O S	NA
Euphorbia	crenulata		EUCR	168	WESTERN WOOD SPURGE	Euphorbiaceae	H	0 5000	CE GORS	NA
Euphorbia	ocellata		EUOC2	169	CANTUA SPURGE	Euphorbiaceae	H	0 1500	GO S	NA
Euphorbia	serpyllifolia		EUSE1	171	THYME-LEAF SPURGE	Euphorbiaceae	H	0 7000	CE GO S	NA
Euphorbia	spathulata		EUSP	168	WART SPURGE	Euphorbiaceae	H	0 4000	CE GO S	NA
Evax	sparsiflora		EVSP	1266	DWARF EVAX	Asteraceae	H	0 2500	CE GO S	NA
Filago	californica		FICA2	1264	CALIFORNIA COTTON ROSE	Asteraceae	H	0 3500	C GO S	NA
Filago	gallica		FIGA	1264	COTTON-ROSE	Asteraceae	H	0 5001	CE GO S	IA
Foeniculum	vulgare		FOVU	1016	SWEET FENNEL	Apiaceae	H	0 4001	CE GO S	IP
Fragaria	californica		FRCA1	776	WOOD STRAWBERRY	Rosaceae	H	0 7000	CE R	NP
Fragaria	chiloensis		FRCH1	776	BEACH STRAWBERRY	Rosaceae	H	0 7000	S	NP
Fritillaria	lanceolata		FRLA1	1341	CHECKER LILY	Liliaceae	H	0 2500	CE O S	NP
Fritillaria	liliacea		FRLI	1339		Liliaceae	H	0 3001	RS	NP
Galium	andrewsii		GAAN1	1041	NEEDLE BEDSTRAW	Rubiaceae	H	1000 6500	C O	NP
Galium	aparine		GAAP	1040	GOOSE GRASS or CLEAVERS	Rubiaceae	H	0 7500	CE GORS	IA
Galium	californicum		GACA1	1042	CALIFORNIA GALIUM	Rubiaceae	H	0 3500	E RS	NP
Galium	murale		GAMU1	1041	MATTED GALIUM	Rubiaceae	H	0 3001	GO	IA
Galium	nuttallii		GANU2	1042	NUTTALL GALIUM	Rubiaceae	H	0 3000	CE O S	NP
Geranium	carolinianum		GECA4	141	CAROLINA GERANIUM	Geraniaceae	H	0 5000	CE GORS	NA
Geranium	dissectum		GEDI	141	CUT-LEAF GERANIUM	Geraniaceae	H	0 3000	CE GORS	IA
Geranium	molle		GEMO	142	HAIRY GERANIUM	Geraniaceae	H	0 3001	CE GORS	IA
Gilia	achilleaefolia		GIAC	482	BLUE GILIA	Polemoniaceae	H	0 4000	CE O S	NA
Gilia	achilleaefolia	multicaulis	GIACM	482	BLUE GILIA	Polemoniaceae	H	0 4000	E GO S	NA
Gilia	capitata		GICA4	480	GLOBE GILIA	Polemoniaceae	H	0 6000	E	NA
Gilia	clivorum		GICL	483		Polemoniaceae	H	0 4001	E GO	NA
Gilia	millefoliata		GIMI2	483		Polemoniaceae	H	0 3800	G	NA
Gilia	tricolor		GITR2	482	BIRD'S-EYE GILIA	Polemoniaceae	H	0 2000	GO	NA
Githopsis	specularioides		GISP2	1065		Asteraceae	H	0 4000	CE GO S	NA
Glycyrrhiza	lepidota		GLLE3	888	WILD LICORICE	Fabaceae	H	0 7500	CE GO S	NP
Gnaphalium	californicum		GNCA	1260	CALIFORNIA EVERLASTING	Asteraceae	H	0 4000	CE O S	NB
Gnaphalium	chilense		GNCH	1260	COTTON-BATTING PLANT	Asteraceae	H	0 6000	E RSW	NA
Gnaphalium	palustre		GNPA	1260	LOWLAND CUDWEED	Asteraceae	H	0 9500	W	NA
Gnaphalium	purpureum		GNPU	1259	PURPLE CUDWEED	Asteraceae	H	0 4001	CE GORS	NA
Gnaphalium	ramosissimum		GNRA	1260	PINK EVERLASTING	Asteraceae	H	0 1500	CE S	NB
Grindelia	camporum		GRCA	1166	GUM PLANT	Asteraceae	H	0 4001	GO	NP
Grindelia	hirsutula		GRHI	1164	HAIRY GRINDELIA	Asteraceae	H	0 4001	O S	NP
Habenaria	elegans		HAEL	1396	REIN-ORCHIS	Orchidaceae	H	0 8000	C O	NP
Hedypnois	cretica		HECR	1302		Asteraceae	H	0 5001	CE GO S	IA
Helenium	puberulum		HEPU1	1139	ROSILLA	Asteraceae	H	0 2000	W	NB
Helianthella	castanea		HECA5	1091	MOUNT DIABLO SUNFLOWER	Asteraceae	H	500 4000	GO	NP
Helianthus	annuus	lenticularis	HEANL	1088	COMMON SUNFLOWER	Asteraceae	H	0 5000	CE GO S	NP
Helianthus	californicus		HECA1	1089	CALIFORNIA SUNFLOWER	Asteraceae	H	0 1500	W	NP
Heliotropium	curassavicum	oculatum	HECUO	554	SALT HELIOTROPE	Boraginaceae	H	0 6700	GO S	NP
Hemizonia	congesta		HECO2	1123	HAYFIELD TARWEED	Asteraceae	H	0 3001	G	NA
Hemizonia	fitchii		HEFI	1122	FITCH SPIDERWEED	Asteraceae	H	0 3000	GO	NP
Hemizonia	lutescens		HELU1	1123	SONOMA TARWEED	Asteraceae	H	0 3001	G	NA
Hemizonia	luzulaefolia		HELU2	1123	TAR-WEED	Asteraceae	H	0 1000	G	NP
Hemizonia	pungens		HEPU2	1121	COMMON SPIKEWEED	Asteraceae	H	0 1000	G	NA
Heracleum	lanatum		HELA2	1026	COW PARSNIP	Apiaceae	H	0 9000	E ORS	NP
Hesperocnide	tenella		HETE1	921	CREEPING NETTLE	Urticaceae	H	0 4001	CE O S	NA
Heterocodon	rariflorum		HERA2	1064		Campanulaceae	H	0 7500	E GO W	NA
Heuchera	micrantha		HEMI4	741	CREVICE ALUM-ROOT	Saxifragaceae	H	0 2000	E RSW	NP
Hieracium	albiflorum		HIAL	1305	WHITE HAWKWEED	Asteraceae	H	0 9700	R	NP
Holocarpha	heermannii		HOHE	1125	HEERMANN TARWEED	Asteraceae	H	0 4000	GO	NA
Holocarpha	virgata		HOVI	1124	STICKY TARWEED	Asteraceae	H	0 2500	GO	NA
Horkelia	californica		HOCA2	761	CALIFORNIA HONEYDEW	Rosaceae	H	0 3501	G S	NP
Horkelia	frondosa		HOFR	761	LEAFY HONEY-DEW	Rosaceae	H	0 1000	CE	NP
Hydrophyllum	occidentale		HYOC	517	SQUAW LETTUCE	Hydrophyllaceae	H	2500 8000	O S	NP
Hypericum	formosum	scouleri	HYFOS	192	ST. JOHN'S WORT	Hypericaceae	H	0 5000	CE RS	NP
Hypochoeris	glabra		HYGL	1302	SMOOTH CAT'S-EAR	Asteraceae	H	0 5001	CE GORS	IA
Hypochoeris	radicata		HYRA2	1302	HAIRY CAT'S-EAR	Asteraceae	H	0 5001	CE GORS	IP
Iris	douglasiana		IRDO	1391	DOUGLAS IRIS	Iridaceae	H	0 1500	E G W	NP
Iris	macrosiphon		IRMA	1390	IRIS	Iridaceae	H	0 3000	E GO S	NP
Lactuca	saligna		LASA	1304		Asteraceae	H	0 4001	CE GORS	IA
Lactuca	serriola		LASE1	1304	PRICKLY LETTUCE	Asteraceae	H	0 5001	CE GORS	IA

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range		Vegtype			MI/L
Lactuca	virosa		LAVI1	1304	TALL LETTUCE	Asteraceae	H	0	4001	CE	G	S	IB
Lagophylla	ramosissima		LARA	1108	SLENDER RABBIT-LEAF	Asteraceae	H	0	5200	CE	GORS		NA
Lamium	amplexicaule		LAAM	698	CLASPING HENBIT	Lamiaceae	H	0	5001		GO	S	IAB
Lasthenia	chrysostoma		LACH3	s152	GOLD FIELDS	Asteraceae	H	0	3000	C	GO	S	NA
Lasthenia	glaberrima		LAGL2	1143		Asteraceae	H	0	1000		GO	SW	NA
Lasthenia	glabrata		LAGL3	1143		Asteraceae	H	0	4500		GO		NA
Lasthenia	microglossa		LAMI2	s152		Asteraceae	H	200	3200	C	GO		NA
Lathyrus	latifolius		LALA3	891	EVERLASTING PEA	Fabaceae	H	0	5001	E	GO		IP
Lathyrus	vestitus		LAVE	892	HILLSIDE PEA	Fabaceae	H	0	4000	E		RS	NP
Lathyrus	vestitus	bolanderi	LAVEB	892	HILLSIDE PEA	Fabaceae	H	0	4000	E		RS	NP
Layia	gaillardioides		LAGA	1112		Asteraceae	H	0	3800		GO	S	NA
Layia	glandulosa		LAGL4	1111		Asteraceae	H	0	7800	E	GO	S	NA
Layia	hieracioides		LAHI2	1112		Asteraceae	H	0	2800	E	GO		NA
Layia	platyglossa	campestris	LAPLC	1111	TIDY TIPS	Asteraceae	H	0	4000	E	GO	S	NA
Lemna	gibba		LEGI	1359	DUCKWEED	Lemnaceae	H	0	7000			W	NP
Lemna	minima		LEMI1	1359	LEAST DUCKWEED	Lemnaceae	H	0	5000			W	NP
Lemna	minor		LEMI2	1359	LESSER DUCKWEED	Lemnaceae	H	0	3500			W	NP
Lemna	valdiviana		LEVA	1359	PALE DUCKWEED	Lemnaceae	H	0	7000			W	NP
Lepidium	latipes		LELA3	229	DWARF PEPPER-GRASS	Brassicaceae	H	0	2000		G	W	NA
Lepidium	nitidum		LENI	228	COMMON PEPPER-GRASS	Brassicaceae	H	0	3000	C	G	S	NA
Lepidium	pinnatifidum		LEPI	227	PEPPER-GRASS	Brassicaceae	H	0	5001		G		IAB
Lepidium	strictum		LEST	227	WAYSIDE PEPPER-GRASS	Brassicaceae	H	0	5001	CE	GO	S	IA
Lessingia	germanorum	glandulifera	LEGEG	1222		Asteraceae	H	0	5500		GO	S	NA
Lewisia	rediviva		LERE	298	BITTER ROOT	Portulacaceae	H	2500	6000	E	O	S	NP
Lilium	pardalinum		LIPA1	1344	TIGER LILY	Liliaceae	H	0	6000			W	NP
Linanthus	ambiguus		LIAM	510		Polemoniaceae	H	0	2800	C	GO		NA
Linanthus	androsaceus		LIAN1	514		Polemoniaceae	H	0	3500	C	GO		NA
Linanthus	bakeri		LIBA2	510		Polemoniaceae	H	0	3000	E	O		NA
Linanthus	bicolor		LIBI1	515		Polemoniaceae	H	0	5000	C	GO		NA
Linanthus	bolanderi		LIBO2	510		Polemoniaceae	H	0	4000	C	O		NA
Linanthus	ciliatus		LICI	513		Polemoniaceae	H	0	8000	CE	GO	S	NA
Linanthus	dicotomus		LIDI2	510	EVENING SNOW	Polemoniaceae	H	0	5000	C	GO	S	NA
Linanthus	pygmaeus		LIPY	509		Polemoniaceae	H	0	5000	C			NA
Linaria	canadensis	texana	LICAT	653	TOAD FLAX	Scrophulariaceae	H	0	2000	CE	GO	S	NAB
Linum	breweri		LIBR2	154	BREWER FLAX	Linaceae	H	400	3300	C	GO		NA
Linum	californicum		LICA3	154	CALIFORNIA FLAX	Linaceae	H	0	2000	C	GO		NA
Linum	micranthum		LIMI	155	LITTLE WHITE FLAX	Linaceae	H	1000	5500	C	GO		NA
Lithophragma	affine		LIAF	s108	WOODLAND STAR	Saxifragaceae	H	0	3500	CE	GO	S	NP
Lithophragma	cymbalaria		LICY	s108	MISSION STAR	Saxifragaceae	H	0	3000		O		NP
Lithophragma	heterophylla		LIHE	737	HILL STAR	Saxifragaceae	H	0	6500	CE	GO	S	NP
Lomatium	californicum		LOCA1	1026	CHU-CHU-PATE	Apiaceae	H	0	5500	C	O		NP
Lomatium	caruifolium		LOCA3	1023	ALKALI PARSNIP	Apiaceae	H	0	4000	E	GO		NP
Lomatium	dasycarpum		LODA1	1024	LACE PARSNIP	Apiaceae	H	0	5000	CE	GO	S	NP
Lomatium	macrocarpum		LOMA3	1024	SHEEP PARSNIP	Apiaceae	H	0	8000		O		NP
Lomatium	nudicaule		LONU1	1026	PESTLE PARSNIP	Apiaceae	H	0	7000	C			NP
Lomatium	utriculatum		LOUT1	1022	BLADDER PARSNIP	Apiaceae	H	0	5000		GO		NP
Lotus	corniculatus		LOCO2	850	BIRD'S-FOOT TREFOIL	Fabaceae	H	0	5001	CE	GO	S	IP
Lotus	crassifolius		LOCR	844	BUCK LOTUS	Fabaceae	H	2000	8000		O		NP
Lotus	humistratus		LOHU2	847	COLCHITA	Fabaceae	H	0	6000	CE	GO	S	NA
Lotus	micranthus		LOMI	847	HILL LOTUS	Fabaceae	H	0	5000	CE	GO	S	NA
Lotus	purshianus		LOPU2	847	SPANISH CLOVER	Fabaceae	H	0	7000	CE	GO	S	NA
Lotus	scoparius		LOSC	849	DEER WEED	Fabaceae	H	0	5000	C		S	NP
Lotus	strigosus		LOST3	846	BISHOP'S LOTUS	Fabaceae	H	0	5000	CE	GO	S	NP
Lotus	subpinnatus		LOSU2	846	CALF LOTUS	Fabaceae	H	0	2500	CE	GO	S	NA
Lupinus	bicolor		LUBI	816	DOVE LUPINE	Fabaceae	H	0	3000	CE	GO	S	NA
Lupinus	bicolor	microphyllus	LUBIM2	816	DOVE LUPINE	Fabaceae	H	0	5000	CE	GO	S	NA
Lupinus	bicolor	tridentatus	LUBIT1	816	DOVE LUPINE	Fabaceae	H	0	5001	CE	GO	S	NA
Lupinus	bicolor	umbellatus	LUBIU	816	DOVE LUPINE	Fabaceae	H	0	4001	CE	GO	S	NA
Lupinus	densiflorus		LUDE	810	WHITE or PURPLE LUPINE	Fabaceae	H	0	2000	CE	GO	S	NA
Lupinus	formosus		LUFO	827	SUMMER LUPINE	Fabaceae	H	0	2500	CE	GO	S	NP
Lupinus	luteolus		LULU1	811	BUTTER LUPINE	Fabaceae	H	0	6000		O		NA
Lupinus	nanus	latifolius	LUNAL	814	DOUGLAS' ANNUAL LUPINE	Fabaceae	H	0	2000		G	S	NA
Lupinus	pachylobus		LUPA2	815	MT. DIABLO ANNUAL LUPINE	Fabaceae	H	0	2000		GO		NA
Lupinus	polycarpus		LUPO2	s115	SMALL-SPIKE LUPINE	Fabaceae	H	0	5000	E	O		NA
Lupinus	subvexus		LUSU3	809	CHICK LUPINE	Fabaceae	H	0	2500		GO		NA
Lupinus	succulentus		LUSU4	813	ARROYO LUPINE	Fabaceae	H	0	2000		GO		NA
Lythrum	californicum		LYCA1	923	CALIFORNIA LOOSE-STRIFE	Lythraceae	H	0	6000			W	NP
Lythrum	hyssopifolia		LYHY	923	GRASS POLY	Lythraceae	H	0	5000			W	NAF
Madia	elegans		MAEL	1115	COMMON MADIA	Asteraceae	H	3000	8000	C	GO		NA
Madia	exigua		MAEX1	1117		Asteraceae	H	0	3000	CE	GO	S	NA
Madia	gracilis		MAGR1	1116	GUM-WEED	Asteraceae	H	0	7800	CE	GO	S	NA
Madia	madioides		MAMA1	1114	WOODLAND TARWEED	Asteraceae	H	0	4000	E		R	NP
Madia	sativa		MASA1	1116	COAST TARWEED	Asteraceae	H	0	1000	CE	GO	S	IA
Malacothrix	clevelandii		MACL1	1298		Asteraceae	H	0	5000	C	O	S	NA
Malacothrix	floccifera		MAFL	1298	WOOLLY-TUFT MALACOTHRIX	Asteraceae	H	0	5000	E	O	S	NA
Malva	neglecta		MANE	129	CHEESE-WEED	Malvaceae	H	0	5001	E	GO	S	IAB
Malva	nicaeensis		MANI1	129	BULL MALLOW	Malvaceae	H	0	5001	CE	GO	S	IA
Malva	parviflora		MAPA1	129	CHEESE-WEED	Malvaceae	H	0	5001	E	GO	S	IA
Marah	fabaceus		MAFA1	1059	VALLEY MANROOT	Cucurbitaceae	H	0	2500	E	GO	S	NP
Marah	fabaceus	agrestis	MAFAA	1059	VALLEY MAN-ROOT	Cucurbitaceae	H	0	5000	CE	O	S	NP
Marah	oreganus		MAOR1	1059	WILD CUCUMBER	Cucurbitaceae	H	0	6000	E		RS	NP

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Marrubium	vulgare		MAVU	695	COMMON HOREHOUND	Lamiaceae	H	0 9000	CE GO S	IP
Matricaria	matricarioides		MAMA3	233	PINEAPPLE WEED	Asteraceae	H	0 9000	CE GO S	NA
Medicago	polymorpha		MEPO	s116	BUR CLOVER	Fabaceae	H	0 9000	CE GO S	IA
Medicago	polymorpha	brevispina	MEPOB	s116	SMOOTH BUR CLOVER	Fabaceae	H	0 9000	CE GO S	IA
Medicago	sativa		MESA	831	ALFALFA	Fabaceae	H	0 5001	GO	IP
Melilotus	albus		MEAL1	832	WHITE SWEET-CLOVER	Fabaceae	H	0 6001	CE GO S	IAB
Melilotus	indicus		MEIN1	832	YELLOW MELILOT	Fabaceae	H	0 9000	CE GO S	IAB
Melilotus	officinalis		MEOF1	832	YELLOW SWEET-CLOVER	Fabaceae	H	0 6001	CE GO S	IAB
Mentha	piperita		MEPI	718	PEPPERMINT	Lamiaceae	H	0 2000	W	IP
Mentha	pulegium		MEPU1	717	PENNYROYAL	Lamiaceae	H	0 3000	GO W	IP
Mentha	spicata		MESP2	718	SPEARMINT	Lamiaceae	H	0 5000	W	IP
Mentzelia	dispersa		MEDI	181	NADA STICK-LEAF	Loasaceae	H	0 6500	CE GO S	NA
Mentzelia	micrantha		MEMI2	181	SAN LUIS STICK-LEAF	Loasaceae	H	0 5000	C	NA
Microcala	quadrangularis		MIQU	438		Gentianaceae	H	0 1000	GO	NA
Micropus	californicus		MICA1	1265		Asteraceae	H	0 5000	CE GO S	NA
Microseris	campestris		MICA2	1291		Asteraceae	H	0 7001	G	NA
Microseris	douglasii		MIDO1	1291	SILVER PUFFS	Asteraceae	H	0 9000	GO	NA
Microseris	elegans		MIEL	1291	NODDING MICROSERIS	Asteraceae	H	0 5000	GO	NA
Microseris	linearifolia		MILI2	s168	UROPAPPUS	Asteraceae	H	0 6100	GO S	NA
Microseris	sylvatica		MISY	1290	SYLVAN SCORZONELLA	Asteraceae	H	0 4500	GO	NA
Microsteris	gracilis		MIGR1	477	ANNUAL PHLOX	Polemoniaceae	H	0 10000	CE GO S	NA
Mimulus	cardinalis		MICA3	610	RED MONKEY-FLOWER	Scrophulariaceae	H	0 8000	W	NP
Mimulus	douglasii		MIDO2	621	DOUGLAS MONKEY-FLOWER	Scrophulariaceae	H	0 4000	CE GO SW	NA
Mimulus	fremontii		MIFR1	619	FREMONT MONKEY-FLOWER	Scrophulariaceae	H	0 7000	C O	NA
Mimulus	guttatus		MIGU	616	COMMON MONKEY-FLOWER	Scrophulariaceae	H	0 10000	W	NP
Mimulus	latidens		MILA3	614		Scrophulariaceae	H	0 2500	GO	NA
Mimulus	nasutus		MINA2	616	SNOUTED MONKEY-FLOWER	Scrophulariaceae	H	0 7500	W	NA
Mimulus	rattanii		MIRA	620	RATTAN MONKEY-FLOWER	Scrophulariaceae	H	0 3500	C	NA
Monardella	douglasii		MODO	716	PERFORATED MONARDELLA	Lamiaceae	H	0 3500	O	NA
Monardella	villosa		MOVI1	712	COYOTE MINT	Lamiaceae	H	0 3000	E S	NP
Monolopia	gracilens		MOGR	1145	SMALL-FLOWERED MONOLOPIA	Asteraceae	H	500 3800	CE R	NA
Monolopia	major		MOMA2	1145	LARGE-FLOWERED MONOLOPIA	Asteraceae	H	1000 1500	G	NA
Montia	gypsophiloides		MOGY	304	ROCK MONTIA	Portulacaceae	H	0 4000	C O W	NA
Montia	perfoliata		MOPE2	302	MINER'S LETTUCE	Portulacaceae	H	0 5000	CE GORS	NA
Montia	spathulata		MOSP2	303	PALE MONTIA	Portulacaceae	H	0 2500	CE O	NA
Montia	spathulata	exigua	MOSPE	304		Portulacaceae	H	0 5500	C O	NA
Montia	verna		MOVE2	302	WATER CHICKWEED	Portulacaceae	H	0 5000	W	NA
Muilla	maritima		MUMA	1379	MUILLA	Amaryllidaceae	H	0 7500	E GO S	NP
Myosotis	sylvatica		MYSY	556	COMMON FORGET-ME-NOT	Boraginaceae	H	0 4001	E	IP
Navarretia	mellita		NAME	505	HONEY-SCENTED NAVARRETIA	Polemoniaceae	H	0 3500	CE O	NA
Navarretia	pubescens		NAPU2	503		Polemoniaceae	H	0 3500	C O	NA
Navarretia	squarrosa		NASQ	505	SKUNKWEED	Polemoniaceae	H	0 2500	E O	NA
Nemophila	heterophylla		NEHE	522	WHITE NEMOPHILA	Hydrophyllaceae	H	0 5000	C O S	NA
Nemophila	menziesii		NEME	520	BABY BLUE-EYES	Hydrophyllaceae	H	0 5000	C GO S	NA
Nemophila	pedunculata		NEPE	521	SPREADING NEMOPHILA	Hydrophyllaceae	H	0 7500	CE GORSW	NA
Nicotiana	attenuata		NIAT	602	COYOTE TOBACCO	Solanaceae	H	0 8500	GO S	NA
Nicotiana	bigelovii		NIBI	602	INDIAN TOBACCO	Solanaceae	H	0 3500	CE GO S	NA
Oenothera	graciliflora		OEGR	951		Onagraceae	H	0 3500	GO	NA
Oenothera	hookeri		OEHO	946	HOOKER EVENING PRIMROSE	Onagraceae	H	0 3500	E RSW	NB
Oenothera	micrantha		OEMI1	955	SMALL PRIMROSE	Onagraceae	H	0 3000	CE G S	NA
Oenothera	micrantha	jonesii	OEMIJ	955	CHAPARRAL SUN-CUP	Onagraceae	H	0 3000	CE S	NA
Oenothera	ovata		OEOV	951	SUN-CUPS	Onagraceae	H	0 3500	E G S	NP
Orobanche	bulbosa		ORBU	683	TUBEROUS BROOM-RAPE	Orobanchaceae	H	0 5000	C	NP
Orobanche	californica		ORCA2	684		Orobanchaceae	H	0 5000	CE GO SW	NP
Orobanche	fasciculata		ORFA2	683	COMMON BROOM-RAPE	Orobanchaceae	H	0 4000	C	NP
Orobanche	uniflora		ORUN	682	NAKED BROOM-RAPE	Orobanchaceae	H	0 7000	C S	NP
Orthocarpus	attenuatus		ORAT	663	VALLEY TASSELS	Scrophulariaceae	H	0 5000	CE GO	NA
Orthocarpus	densiflorus		ORDE	662	OWL'S CLOVER	Scrophulariaceae	H	0 2500	E GO S	NA
Orthocarpus	erianthus		ORER	664	JOHNNY-TUCK	Scrophulariaceae	H	0 4000	GO	NA
Orthocarpus	lithospermoides		ORLI2	661	CREAM SACS	Scrophulariaceae	H	0 3000	CE GO	NA
Orthocarpus	purpurascens		ORPU1	662	PURPLE OWL'S CLOVER	Scrophulariaceae	H	0 3000	GO S	NA
Orthocarpus	pusillus		ORPU2	664	DWARF OWL'S CLOVER	Scrophulariaceae	H	0 4000	E GO	NA
Osmorhiza	brachypoda		OSBR	1008	CALIFORNIA CICELY	Apiaceae	H	0 8500	O	NP
Osmorhiza	chilensis		OSCH	1009	MOUNTAIN WOOD-CICELY	Apiaceae	H	0 8000	E R	NP
Oxalis	corniculata		OXCO1	148	CREEPING WOOD SORREL	Oxalidaceae	H	0 5001	G	IP
Oxalis	oregana		OXOR1	148	REDWOOD SORREL	Oxalidaceae	H	0 2000	R	NP
Papaver	californicum		PACA2	200	WIND POPPY	Papaveraceae	H	0 2500	C O	NA
Parvisedum	pentandrum		PAPE2	720		Crassulaceae	H	800 2500	C O	NA
Pectocarya	pusilla		PEPU1	556		Boraginaceae	H	0 3000	C O	NA
Pedicularis	densiflora		PEDE1	658	INDIAN WARRIOR	Scrophulariaceae	H	0 6000	C O	NP
Penstemon	corymbosus		PECO4	641	ROCK PENSTEMON	Scrophulariaceae	H	0 5000	E R	NP
Penstemon	heterophyllus		PEHE3	639	VARICOLORED PENSTEMON	Scrophulariaceae	H	0 5500	C O	NP
Perideridia	californica		PECA3	1013		Apiaceae	H	0 3000	O W	NP
Perideridia	gairdneri		PEGA	1013	SQUAW-ROOT	Apiaceae	H	0 11000	W	NP
Perideridia	kelloggii		PEKE	1012	DOBIE SPINDLE-ROOT	Apiaceae	H	0 4000	CE GO W	NP
Petasites	palmatus		PEPA6	1253	WESTERN COLT'S FOOT	Asteraceae	H	0 1000	E R	NP
Phacelia	breweri		PHBR3	535	BREWER PHACELIA	Hydrophyllaceae	H	0 4200	C O	NA
Phacelia	ciliata		PHCI2	531	FIELD PHACELIA	Hydrophyllaceae	H	0 5000	GO S	NA
Phacelia	distans		PHDI1	529	WILD HELIOTROPE	Hydrophyllaceae	H	0 7000	CE O S	NA
Phacelia	divaricata		PHDI2	538		Hydrophyllaceae	H	0 4000	CE GO	NA
Phacelia	imbricata		PHIM	532	ROCK PHACELIA	Hydrophyllaceae	H	0 3000	C O	NP

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range	Vegtype	MI/L
Phacelia	nemoralis		PHNE2	534	BRISTLY PHACELIA	Hydrophyllaceae	H	0 3000	E ORS	WBP
Phacelia	phacelioides		PHPH	537	DIABLO PHACELIA	Hydrophyllaceae	H	2000 3500	C O	NA
Phacelia	rattanii		PHRA3	531		Hydrophyllaceae	H	0 4000	OR W	NA
Phacelia	suaveolens		PHSU	539		Hydrophyllaceae	H	1000 4000	C	NA
Phacelia	tanacetifolia		PHTA	529	TANSY-LEAF PHACELIA	Hydrophyllaceae	H	0 4000	CE GO S	NA
Pholistoma	auritum		PHAU2	518	FIESTA FLOWER	Hydrophyllaceae	H	0 4500	C O S	NA
Pholistoma	membranaceum		PHME	518		Hydrophyllaceae	H	0 3500	C O	NA
Phoradendron	flavescens	macrophyllum	PHFLM	991	LARGE-LEAF MISTLETOE	Loranthaceae	H	0 5001	O W	NP
Phoradendron	flavescens	villosum	PHFLV	991	COMMON or HAIRY MISTLETOE	Loranthaceae	H	0 5001	CE O SW	NP
Picris	echioides		PIEC	1303	BRISTLY OX-TONGUE	Asteraceae	H	0 5001	E GO S	IAB
Plagiobothrys	acanthocarpus		PLAC	583		Boraginaceae	H	0 2000	C G	NA
Plagiobothrys	bracteatus		PLBR	586	BRACTED BORAGE	Boraginaceae	H	0 5000	GO SW	NA
Plagiobothrys	bracteatus		PLBR	586		Boraginaceae	H	0 5000	CE GO SW	NA
Plagiobothrys	fulvus	campestris	PLFUC	580		Boraginaceae	H	0 1500	GO	NA
Plagiobothrys	nothofulvus		PLNO	580	POPCORN FLOWER	Boraginaceae	H	0 2500	GO S	NA
Plagiobothrys	tenellus		PLTE1	581		Boraginaceae	H	0 5000	C O	NA
Plantago	erecta		PLER2	408	CALIFORNIA DWARF PLANTAIN	Plantaginaceae	H	0 2500	C GO S	NA
Plantago	lanceolata		PLLA	408	ENGLISH PLANTAIN	Plantaginaceae	H	0 5001	E GORS	IA
Plantago	major		PLMA1	406	COMMON PLANTAIN	Plantaginaceae	H	0 5001	E GO S	IAP
Platystemon	californicus		PLCA4	193	CREAM CUPS	Papaveraceae	H	0 3000	C GO	NA
Plectritis	ciliosa		PLCI	1056	LONG-SPURRED PLECTRITIS	Valerianaceae	H	0 4000	GO	NA
Plectritis	macrocera		PLMA2	1055	SHORT-SPURRED PLECTRITIS	Valerianaceae	H	0 4000	GO	NA
Pogogyne	serpylloides		POSE2	710		Lamiaceae	H	0 4000	CE O W	NA
Polygala	californica		POCA8	156	CALIFORNIA MILKWORT	Polygalaceae	H	0 3000	C R	NP
Polygonum	amphibium		POAM3	364	WATER PERSICARIA	Polygonaceae	H	0 10000	W	NP
Polygonum	aviculare		POAV	362	WIRE GRASS	Polygonaceae	H	0 3001	CE GO S	NA
Polygonum	coccineum		POCO3	364	SWAMP KNOTWEED	Polygonaceae	H	0 5001	W	NP
Potamogeton	crispus		POCR	1317	CURLY PONDWEED	Potamogetonaceae	H	0 5001	F	IP
Potamogeton	illinoensis		POIL	1319	ILLINOIS PONDWEED	Potamogetonaceae	H	0 5000	F	NP
Potamogeton	pectinatus		POPE3	1317	PONDWEED	Potamogetonaceae	H	0 7000	F	NP
Portulaca	oleracea		POOL	296	PURSLANE	Portulacaceae	H	0 5001	GO S	IP
Potentilla	glandulosa		POGL2	774	STICKY CINQUEFOIL	Rosaceae	H	0 8000	CE GO S	NP
Prunella	vulgaris		PRVU	697	SELF-HEAL	Lamiaceae	H	0 5001	E GO	IP
Psilocarphus	tenellus		PSTE	1265	SLENDER WOOLLY-HEADS	Asteraceae	H	0 6000	W	NA
Psoralea	californica		PSCA1	850	CALIFORNIA PSORALEA	Fabaceae	H	1500 5500	C O	NP
Psoralea	physodes		PSPH	851	CALIFORNIA TEA	Fabaceae	H	0 7500	CE O S	NP
Pterostegia	drymarioides		PTDR	322	PINK CREEPER	Polygonaceae	H	0 5000	CE O S	NA
Rafinesquia	californica		RACA1	1297	CALIFORNIA CHICORY	Asteraceae	H	0 10000	C S	NA
Ranunculus	aquatilis		RAAQ	101	WATER CROWFOOT/BUTTERCUP	Ranunculaceae	H	0 6000	W	NP
Ranunculus	californicus		RACA2	95	CALIFORNIA BUTTERCUP	Ranunculaceae	H	0 3000	E GO SW	NP
Ranunculus	canus		RACA3	95		Ranunculaceae	H	0 1000	GO	NP
Ranunculus	hebecarpus		RAHE	97	DOWNY BUTTERCUP	Ranunculaceae	H	0 3000	C O	NA
Ranunculus	muricatus		RAMU1	97	SPINY-FRUITED BUTTERCUP	Ranunculaceae	H	0 3000	W	IA
Ranunculus	repens		RARE	93	CREEPING BUTTERCUP	Ranunculaceae	H	0 3001	GO W	IP
Raphanus	sativus		RASA2	238	WILD RADISH	Brassicaceae	H	0 5001	GO	IA
Rigiopappus	leptocladus		RILE	1152	BRISTLE-HEAD	Asteraceae	H	0 5000	CE GO S	NA
Romanzoffia	suksdorfii		ROSU1	550		Hydrophyllaceae	H	0 2500	E R	NP
Rorippa	curvisiliqua		ROCU	239	WESTERN YELLOW CRESS	Brassicaceae	H	0 10000	W	NAB
Rorippa	nasturtium-aquaticum		RONA	240	WATER CRESS	Brassicaceae	H	0 8000	W	IP
Rubus	vitifolius		RUVI2	783	COAST CALIF. BLACKBERRY	Rosaceae	H	0 4000	E RS	NP
Rumex	acetosella		RUAC	356	SHEEP SORREL	Polygonaceae	H	0 10000	GO	IP
Rumex	conglomeratus		RUCO	358	WHORLED DOCK	Polygonaceae	H	0 4001	W	IP
Rumex	crispus		RUCR2	358	CURLY DOCK	Polygonaceae	H	0 7001	E GO S	IP
Rumex	occidentalis		RUOC2	358	WESTERN DOCK	Polygonaceae	H	0 5001	F W	NP
Rumex	pulcher		RUPU	359	FIDDLE DOCK	Polygonaceae	H	0 5001	E GO S	IP
Sagina	occidentalis		SAOC1	277	WESTERN PEARLWORT	Caryophyllaceae	H	0 8000	CE GO S	NA
Salsola	kali	tenuifolia	SAKAT	384	RUSSIAN THISTLE	Chenopodiaceae	H	0 6001	GO	IAP
Salvia	columbariae		SACO1	703	CHIA	Lamiaceae	H	0 4000	C O S	NA
Salvia	spathacea		SASP	704	CRIMSON SAGE	Lamiaceae	H	0 2000	C O S	NP
Sanicula	bipinnata		SABI2	1006	POISON SANICLE	Apiaceae	H	0 5000	GO S	NP
Sanicula	bipinnatifida		SABI3	1005	PURPLE SANICLE	Apiaceae	H	0 6000	C GO	NP
Sanicula	crassicaulis		SACR2	1005	GAMBLE WEED	Apiaceae	H	0 4500	GORS	NP
Sanicula	laciniata		SALA2	1005	COAST SANICLE	Apiaceae	H	0 1000	E	NP
Sanicula	saxatilis		SASA2	1006	DEVIL'S SANICLE	Apiaceae	H	3000 3800	C O	NP
Sanicula	tuberosa		SATU	1006	TURKEY PEA	Apiaceae	H	0 8000	C O	NP
Satureja	douglasii		SADO1	708	YERBA BUENA	Lamiaceae	H	0 3000	CE RS	NP
Saxifraga	californica		SACA2	736	CALIFORNIA SAXIFRAGE	Saxifragaceae	H	0 5000	C O S	NP
Scandix	pecten-veneris		SCPE	1008	SHEPHERD'S NEEDLE	Apiaceae	H	0 5001	CE GO S	IA
Scrophularia	californica		SCCA2	642	CALIFORNIA FIGWORT	Scrophulariaceae	H	0 2000	RSW	NP
Scutellaria	tuberosa	similis	SCTUS	694	BLUE SKULL-CAP	Lamiaceae	H	0 5000	C O	NP
Sedum	spathulifolium		SESP2	727	MOSS SEDUM	Crassulaceae	H	0 7500	E R	NP
Senecio	aronicoides		SEAR	1248		Asteraceae	H	0 8000	C	NP
Senecio	breweri		SEBR	1251	BREWER SENECIO	Asteraceae	H	0 5500	C O	NP
Senecio	sylvaticus		SESY	1252	WOOD GROUNDSEL	Asteraceae	H	0 3001	C GO S	IA
Senecio	vulgaris		SEVU	1252	COMMON GROUNDSEL	Asteraceae	H	0 5001	CE GOR	IA
Sherardia	arvensis		SHAR1	1045	BLUE FIELD MADDER	Rubiaceae	H	0 5001	GO	IA
Sidalcea	malvaeflora		SIMA1	132	CHECKER BLOOM	Malvaceae	H	0 2000	E GO	NP
Silene	antirrhina		SIAN	287	SLEEPY CATCHFLY	Caryophyllaceae	H	0 5000	CE GO S	NA
Silene	californica		SICA2	288	INDIAN PINK	Caryophyllaceae	H	0 5000	CE O S	NP
Silene	gallica		SIGA	288	WINDMILL PINK	Caryophyllaceae	H	0 5001	CE GO S	IA
Silene	verecunda		SIVE	291	COAST PINK	Caryophyllaceae	H	0 4001	S	NP

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range	Vegtype	NI/L
Silybum	marianum		SIMA2	1273	MILK THISTLE	Asteraceae	H	0 5001	CE GORS	IAB
Sisymbrium	officinale		SIOF	231	HEDGE MUSTARD	Brassicaceae	H	0 5000	CE GO S	IA
Sisyrinchium	bellum		SIBE	1392	BLUE-EYED GRASS	Iridaceae	H	0 3000	GO	NP
Smilacina	racemosa	amplexicaulis	SMRAA	1331	FAT SOLOMON'S SEAL	Liliaceae	H	0 6000	E R	NP
Smilacina	stellata	sessilifolia	SMSTS	1331	FALSE SOLOMON'S SEAL	Liliaceae	H	0 4001	CE R W	NP
Solanum	nigrum		SONI	597	BLACK NIGHTSHADE	Solanaceae	H	0 5001	GO	IA
Solidago	californica		SOCA2	1185	CALIFORNIA GOLDENROD	Asteraceae	H	200 7500	CE O S	NP
Soliva	sessilis		SOSE	1233		Asteraceae	H	0 3000	E GO S	NA
Sonchus	asper		SOAS	1304	PRICKLY SOW-THISTLE	Asteraceae	H	0 5001	E GORS	IA
Sonchus	oleraceus		SOOL	1303	COMMON SOW-THISTLE	Asteraceae	H	0 5001	E GORS	IA
Spergula	arvensis		SPAR	283	SPURREY	Caryophyllaceae	H	0 5001	GO	IA
Stachys	bullata		STBU	699	CALIFORNIA HEDGE NETTLE	Lamiaceae	H	0 4000	CE RS	NP
Stachys	chamissonis		STCH	699	HEDGE-NETTLE	Lamiaceae	H	0 2200	E RS	NP
Stachys	pycnantha		STPY	700		Lamiaceae	H	0 3500	E O	NP
Stachys	rigida		STRI	700	HEDGE NETTLE	Lamiaceae	H	0 8000	R	NP
Stachys	rigida	quercetorum	STRIQ	700	HEDGE NETTLE	Lamiaceae	H	0 5000	E O S	NP
Stachys	rigida		STME	275	COMMON CHICKWEED	Caryophyllaceae	H	0 5001	E ORS	IA
Stellaria	media		STNI	275	SHINING CHICKWEED	Caryophyllaceae	H	0 5500	GO	NA
Stellaria	nitens		STVI2	1295	TWIGGY WREATH PLANT	Asteraceae	H	0 6000	E GO S	NA
Stephanomeria	virgata		STGLA	220	JEWEL FLOWER	Brassicaceae	H	0 4000	C O	NA
Streptanthus	glandulosus	albidus	STHI	221	HAIRY TWISTED-FLOWER	Brassicaceae	H	2000 3850	C	NA
Streptanthus	hispidus		STFI	1263		Asteraceae	H	0 5500	C O S	NA
Stylocline	filaginea		STHE2	200	WIND POPPY	Papaveraceae	H	0 4000	C GO	NA
Stylomecon	heterophylla		TAOF	1310	COMMON DANDELION	Asteraceae	H	0 10000	E GORS	IBP
Taraxacum	officinale		TAHA	1017		Apiaceae	H	0 5000	C O	NP
Tauschia	hartwegii		THPO	107	FOOTHILL MEADOW RUE	Ranunculaceae	H	0 2500	E O S	NP
Thalictrum	polycarpum		THFL1	215		Brassicaceae	H	0 2000	G	NA
Thelypodium	flavescens		THLA2	216	CUT-LEAVED THELYPODIUM	Brassicaceae	H	0 5000	GO	NA
Thelypodium	lasiophyllum		THCU	254	FRINGE-POD	Brassicaceae	H	0 5000	C GO S	NA
Thysanocarpus	curvipes		THLA3	254		Brassicaceae	H	0 3500	C GO S	NA
Thysanocarpus	laciniatus		TIAQ	719	WATER PYGMY	Crassulaceae	H	0 2000	W	NA
Tillaea	aquatica		TIER	719	SAND PYGMY	Crassulaceae	H	0 2500	CE O S	NA
Tillaea	erecta		TOTE	647		Scrophulariaceae	H	0 3000	C O	NA
Tonella	tenella		TONO	1007	KNOTTED HEDGE PARSLEY	Apiaceae	H	0 2000	E O	IA
Torilis	nodosa		TRPO1	1301	OYSTER ROOT or SALSIFY	Asteraceae	H	0 5001	GO S	IBP
Tragopogon	porrifolius		TRTE	159	PUNCTURE-VINE	Zygophyllaceae	H	0 5000	GO S	IA
Tribulus	terrestris		TRLA1	693	VINEGAR WEED / BLUE CURLS	Lamiaceae	H	0 3500	C O S	NA
Trichostema	lanceolatum		TRLA3	404	STARFLOWER	Primulaceae	H	0 4500	E R	NP
Trientalis	latifolia		TRAL	838	RANCHERIA CLOVER	Fabaceae	H	0 4000	GO	NA
Trifolium	albopurpureum	truncatum	TRAMT	841	BLADDER CLOVER	Fabaceae	H	0 2500	GO S	NA
Trifolium	amplectens		TRBA	839	COLONY CLOVER	Fabaceae	H	0 1501	E GO	W NP
Trifolium	barbigerum	decipiens	TRBID	834	PINOLE CLOVER	Fabaceae	H	0 2300	E G	NA
Trifolium	bifidum		TRCI	835	TREE CLOVER	Fabaceae	H	0 5000	E GO	NA
Trifolium	ciliolatum		TRDI	838		Fabaceae	H	0 3500	E GO	NA
Trifolium	dichotomum		TRFU	841	BULL CLOVER	Fabaceae	H	0 3000		W NA
Trifolium	fucatum		TRGR2	835	PIN-POINT CLOVER	Fabaceae	H	0 5000	C GO	NA
Trifolium	gracilentum		TRIN2	837	CLOVER	Fabaceae	H	0 4001	GO S	IA
Trifolium	incarnatum		TRMI2	839	MAIDEN CLOVER	Fabaceae	H	0 8500	GO	NA
Trifolium	microcephalum		TRMI3	839	THIMBLE CLOVER	Fabaceae	H	0 4000	E G	NA
Trifolium	microdon		TROB2	841	CREEK CLOVER	Fabaceae	H	0 5000		W NA
Trifolium	obtusiflorum		TROL1	840	LANKY CLOVER	Fabaceae	H	0 3500	E R	NA
Trifolium	oliganthum		TROL2	838		Fabaceae	H	0 1200	GO	NA
Trifolium	olivaceum		TROLC	838		Fabaceae	H	0 1200	GO	NA
Trifolium	olivaceum	columbianum	TRTR2	841	TOMCAT CLOVER	Fabaceae	H	0 5000	GO	NA
Trifolium	tridentatum		TRVA	840	WHITE-TIP CLOVER	Fabaceae	H	0 8000		W NA
Trifolium	variegatum		TRWO2	840	COW CLOVER	Fabaceae	H	0 10000		W NP
Trifolium	wormskioldii		TRCH	1355	TRILLIUM	Liliaceae	H	0 3500	E RS	NP
Trillium	chloropetalum	giganteum	TRCHG	1355	RED TRILLIUM	Liliaceae	H	0 3500	CE	NP
Trillium	chloropetalum		TROV2	1355	WESTERN WAKE ROBIN	Liliaceae	H	0 4001	E R	NP
Trillium	ovatum		TRBI2	1064		Campanulaceae	H	0 6500	C	NA
Triodanus	biflora		TRCA2	245	ALKALI POD	Brassicaceae	H	0 3500	GO	NA
Tropidocarpum	capparideum		TRGR4	244	WORM SEED MUSTARD	Brassicaceae	H	0 5000		W NP
Tropidocarpum	gracile		URHO	920	CREEK NETTLE	Urticaceae	H	0 9000	E ORSW	NP
Urtica	holosericea		URUR	921	DWARF NETTLE	Urticaceae	H	0 5001	G	IA
Urtica	urens		VAPL	112	INSIDE-OUT FLOWER	Berberidaceae	H	100 2000	R	NP
Vancouveria	planipetala		VELA	687	VERVAIN	Verbenaceae	H	0 8000	E GO S	NP
Verbena	lasiostachys		VERO	688		Verbenaceae	H	0 5001	E GO S	NP
Verbena	robusta		VEAM	656	AMERICAN BROOKLIME	Scrophulariaceae	H	0 10500	R W	NP
Veronica	americana		VEPEX	655	NECKWEED	Scrophulariaceae	H	0 10200		W NA
Veronica	peregrina	xalapensis	VEPE	656	PERSIAN SPEEDWELL	Scrophulariaceae	H	0 5001	G	IA
Veronica	persica		VIAMO	895	AMERICAN VETCH	Fabaceae	H	0 5000	E GO S	NP
Vicia	americana	oregana	VIAMT	895	AMERICAN VETCH	Fabaceae	H	0 5000	E GO S	NP
Vicia	americana	truncata	VIAN	896	COMMON VETCH	Fabaceae	H	0 5001	E GORS	IA
Vicia	angustifolia		VIDA	896	WOOLLYPOD VETCH	Fabaceae	H	0 4001	G	IAB
Vicia	dasycarpa		VIEX	895	CALIFORNIA VETCH	Fabaceae	H	0 2000	CE GO S	NA
Vicia	exigua		VISA	896	SPRING VETCH	Fabaceae	H	0 5001	CE GO S	IA
Vicia	sativa		VIMA1	450	PERIWINKLE	Apocynaceae	H	0 4001	E R	IP
Vinca	major		VIAD	190	BLUE VIOLET	Violaceae	H	25 8500	E OR W	NP
Viola	adunca		VIPE	188	GRASS PANSY	Violaceae	H	0 2500	GO S	NP
Viola	pedunculata		VIPU	187	MOUNTAIN VIOLET	Violaceae	H	1800 6000	CE GO S	NP
Viola	purpurea		VIQU	188	OAK VIOLET	Violaceae	H	0 7000	C O	NP
Viola	quercetorum									

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Viola	sempervirens		VISE	185	REDWOOD VIOLET	Violaceae	H	0 3500	E R	NP
Viola	sheltonii		VISH	189	FAN VIOLET	Violaceae	H	2500 8000	CE	NP
Wyethia	angustifolia		WYAN	1085	NARROW LEAF MULE-EARS	Asteraceae	H	0 5500	GO	NP
Wyethia	glabra		WYGL	1084	SMOOTH MULE-EARS	Asteraceae	H	0 2700	CE	NP
Wyethia	helenioides		WYHE	1084	WOOLLY MULE-EARS	Asteraceae	H	0 6000	GO	NP
Xanthium	spinosum		XASP	1105	SPINY CLOTBUR	Asteraceae	H	0 3000	CE GO S	NA
Xanthium	strumarium	canadense	XASTC	1105	COCKLE BUR	Asteraceae	H	0 6001	CE GO S	NA
Zauschneria	californica		ZACA1	926	CALIFORNIA FUCHSIA	Onagraceae	H	0 3500	CE O S	NP
Zigadenus	fremontii		ZIFR	1334	STAR ZYGADENE	Liliaceae	H	0 3500	CE GO	NP

Grasses and Grasslike

Agropyron	trachycaulum		AGTR1	1503	SLENDER WHEATGRASS	Poaceae	G	0 11000	CE G S	NP
Agrostis	stolonifera	major	AGSTM	s192	REDTOP	Poaceae	G	0 7500	W	IP
Agrostis	exarata		AGEX1	1522	SPIKE REDTOP	Poaceae	G	0 10000	CE GO SW	NP
Agrostis	semiverticillata		AGSE	1520	WATER BENT	Poaceae	G	0 5001	G W	IP
Aira	caryophyllea		AICA	1514	SILVER HAIRGRASS	Poaceae	G	0 5000	CE GO S	IA
Alopecurus	pratensis		ALPR1	1523	MEADOW FOXTAIL	Poaceae	G	0 3001	F W	IP
Avena	barbata		AVBA	1514	SLENDER WILD OAT	Poaceae	G	0 5001	CE GO S	IA
Avena	fatua		AVFA	1514	WILD OAT	Poaceae	G	0 5001	CE GO S	IA
Briza	maxima		BRMA1	1491	BIG QUAKING GRASS	Poaceae	G	0 5001	CE GO S	IA
Briza	minor		BRMI1	1490	LITTLE QUAKING GRASS	Poaceae	G	0 5001	CE GO S	IA
Bromus	carinatus		BRCA1	1470	CALIFORNIA BROME GRASS	Poaceae	G	0 10000	CE GO S	MAB
Bromus	diandrus		BRDI2	s187	RIPGUT / NEEDLE BROME	Poaceae	G	0 4001	CE GO S	IA
Bromus	laevipes		BRLA1	1471	WOODLAND BROME GRASS	Poaceae	G	0 8600	CE O SW	NP
Bromus	madritensis		BRMA2	1474	SPANISH BROME GRASS	Poaceae	G	0 5001	CE GO S	IA
Bromus	mollis		BRMO2	1473	SOFT BROME or SOFT CHEAT	Poaceae	G	0 5001	CE GO S	IA
Bromus	racemosus		BRRA	1473	SMOOTH BROME	Poaceae	G	0 5001	CE GO S	IA
Bromus	rubens		BRRU	1474	RED / FOXTAIL BROME	Poaceae	G	0 4001	CE GO S	IA
Bromus	tectorum		BRTE	1474	CHEAT GRASS	Poaceae	G	0 9001	CE GO S	IA
Bromus	trinii		BRTR	1474	CHILEAN BROME GRASS	Poaceae	G	0 5000	CE GO S	IA
Calamagrostis	rubescens		CARU	1517	PINEGRASS	Poaceae	G	0 2500	CE R	NP
Carex	barbarae		CABA1	1459	SANTA BARBARA SEDGE	Cyperaceae	G	0 3000	E GO	NP
Carex	bolanderi		CABO2	1443	BOLANDER'S SEDGE	Cyperaceae	G	150 8100	W	NP
Carex	dudleyi		CADU1	1440	DUDLEY SEDGE	Cyperaceae	G	0 2500	E G W	NP
Carex	globosa		CAGL1	1450	ROUND-FRUITED SEDGE	Cyperaceae	G	0 4200	E ORS	NP
Carex	lanuginosa		CALA3	1455	WOOLLY SEDGE	Cyperaceae	G	0 10750	GO	NP
Carex	serratodens		CASE2	1458	BIFID SEDGE	Cyperaceae	G	0 6000	E GO W	NP
Cortaderia	selloana		COSE1	1496	PAMPAS GRASS	Poaceae	G	0 3001	GO S	IP
Cynodon	dactylon		CYDA	1537	BERMUDA GRASS	Poaceae	G	0 3000	CE GO S	NP
Cynosurus	echinatus		CYEC	1495	DOGTAIL GRASS	Poaceae	G	0 5001	GO	IA
Cyperus	niger	capitatus	CYNIC	1424	BROWN CYPERUS	Cyperaceae	G	0 3000	W	NP
Danthonia	californica		DACA1	1516	CALIFORNIA OATGRASS	Poaceae	G	0 5000	C GO S	NP
Deschampsia	danthonioides		DEDA	1513	ANNUAL HAIRGRASS	Poaceae	G	0 9000	G SW	NA
Distichlis	spicata	nana	DISPN	1494	SALT GRASS	Poaceae	G	0 3001	G	NP
Echinochloa	crusgalli		ECCR	1547	WATER / BARNYARD GRASS	Poaceae	G	0 6001	CE GO SW	IA
Elymus	glaucus		ELGL	1505	BLUE WILD-RYE	Poaceae	G	0 7500	CE GO S	NP
Elymus	triticoides		ELTR	1505	BEARDLESS WILD-RYE	Poaceae	G	0 7500	CE GO S	NP
Equisetum	arvense		EQAR	28	COMMON HORSETAIL	Equisetaceae	G	0 10000	F W	NP
Equisetum	funstoni		EQFU	27	FUNSTON SCOURING-RUSH	Equisetaceae	G	0 8000	W	NA
Equisetum	hyemale	robustum	EQHYR	27	GIANT SCOURING-RUSH	Equisetaceae	G	0 8500	CE GORSW	NP
Equisetum	telmateia	braunii	EQTEB	27	GIANT HORSETAIL	Equisetaceae	G	0 4500	W	NP
Eragrostis	curvula		ERCU	1493	CREEPING LOVEGRASS	Poaceae	G	0 5001	GO	NP
Festuca	californica		FECA	1477	CALIFORNIA FESCUE	Poaceae	G	0 6000	CE GO S	NP
Festuca	confusa		FECO	1476	HAIRY-LEAVED FESCUE	Poaceae	G	0 5000	CE GO S	NA
Festuca	dertonensis		FEDE	1476		Poaceae	G	0 5001	CE GO S	IA
Festuca	eastwoodae		FEEA	1476	EASTWOOD FESCUE	Poaceae	G	0 5001	CE GO S	NA
Festuca	elmeri		FEEL2	1477	ELMER FESCUE	Poaceae	G	0 5000	E O	NP
Festuca	grayi		FEGR	1476	GRAY'S FESCUE	Poaceae	G	0 6000	CE GO S	NA
Festuca	megalura		FEME	1476	FOXTAIL FESCUE	Poaceae	G	0 5500	CE GO S	NA
Festuca	microstachys		FEMI	1476		Poaceae	G	0 5500	CE GO S	NA
Festuca	myuros		FEMY	1476	RAT-TAIL FESCUE	Poaceae	G	0 5500	CE GO S	NA
Festuca	octoflora		FEOC2	1476	SIX-WEEKS FESCUE	Poaceae	G	0 5000	CE GO S	NA
Festuca	pacifica		FEPA	1476	PACIFIC FESCUE	Poaceae	G	0 5000	CE GO S	NA
Festuca	reflexa		FERE	1476	FEW-FLOWERED FESCUE	Poaceae	G	0 5000	CE GO S	NA
Gastridium	ventricosum		GAVE1	1525	NIT-GRASS	Poaceae	G	0 5001	GO S	IA
Heleocharis	montevidensis	parishii	HEMOP	1420	PURPLE SPIKE-RUSH	Cyperaceae	G	0 7000	W	NP
Heleocharis	palustris		HEPA2	1421	COMMON SPIKE-RUSH	Cyperaceae	G	0 8000	W	NP
Hierochloe	occidentalis		HIOC	1541	VANILLA GRASS	Poaceae	G	0 2000	E R	NP
Holcus	lanatus		HOLA1	1515	VELVET GRASS	Poaceae	G	0 7500	GO	IP
Hordeum	brachyantherum		HOBR	1508	MEADOW BARLEY	Poaceae	G	0 11000	CE GO SW	NP
Hordeum	geniculatum		HOGE	s190	MEDITERRANEAN BARLEY	Poaceae	G	0 6001	CE GO S	IA
Hordeum	leporinum		HOLE	1509	FOXTAIL BARLEY	Poaceae	G	0 5001	CE GOR	IA
Isoetes	howellii		ISHO	26	HOWELL QUILLWORT	Isoetaceae	G	0 9000	W	NP
Juncus	balticus		JUBA	1405	WIRE RUSH	Juncaceae	G	0 9000	W	NP
Juncus	bufonius		JUBU	1405	TOAD RUSH	Juncaceae	G	0 8000	W	NA
Juncus	effusus	pacificus	JUEFP	1404	BOG RUSH	Juncaceae	G	0 8000	W	NP
Juncus	mexicanus		JUME3	1404	MEXICAN RUSH	Juncaceae	G	0 11000	W	NP
Juncus	patens		JUPA2	1404	SPREADING RUSH	Juncaceae	G	0 5000	W	NP
Juncus	xiphioides		JUXI	1411	IRIS-LEAVED RUSH	Juncaceae	G	0 7000	W	NP

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range	Vegtype	NI/L
Koeleria	cristata		KOCR	1511	JUNEGRASS	Poaceae	G	0 11500	CE GO S	NP
Lolium	multiflorum		LOMU	1510	ITALIAN RYEGRASS	Poaceae	G	0 4001	CE GO S	IP
Lolium	perenne		LOPE1	1509	PERENNIAL RYEGRASS	Poaceae	G	0 4001	CE GO S	IP
Lolium	temulentum		LOTE	1510	DARNEL	Poaceae	G	0 4000	CE GO S	IA
Luzula	comosa		LUCO1	1413	COMMON WOODRUSH	Juncaceae	G	3000 10500	E	NP
Luzula	subsessilis		LUSU2	1413	FOOTHILL WOOD-RUSH	Juncaceae	G	0 4000	E GO S	NP
Melica	bulbosa		MEBU	1498	ONION-GRASS	Poaceae	G	2900 11000	E G W	NP
Melica	californica		MECA1	1498	CALIFORNIA MELIC	Poaceae	G	0 3000	E GO	NP
Melica	imperfecta		MEIM	1496	SMALL-FLOWERED MELIC	Poaceae	G	0 4000	C O S	NP
Melica	torreyana		METO1	1498	TORREY MELIC	Poaceae	G	0 2500	CE	NP
Phalaris	minor		PHMI1	1542	CANARY GRASS	Poaceae	G	0 5001	CE GO S	IA
Phalaris	tuberosa	stenoptera	PHTUS	1542	HARDING GRASS	Poaceae	G	0 3001	G W	IP
Poa	annua		POAN1	1484	ANNUAL BLUEGRASS	Poaceae	G	0 3000	CE GO S	IA
Poa	bolanderi	howellii	POBOH	1484	HOWELL BLUEGRASS	Poaceae	G	0 2500	O	NA
Poa	scabrella		POSC3	1489	PINE BLUEGRASS	Poaceae	G	0 5000	CE GO S	NP
Polypogon	interruptus		POIN2	1524	DITCH POLYPOGON	Poaceae	G	0 5001	CE GO SW	IP
Polypogon	monspeliensis		POMO1	1524	RABBITFOOT GRASS	Poaceae	G	0 5001	CE GO SW	IA
Scirpus	acutus		SCAC	1418	COMMON TULE	Cyperaceae	G	0 5000	F W	NP
Scirpus	americanus		SCAM	1417	THREE-SQUARE	Cyperaceae	G	0 7000	W	NP
Scirpus	microcarpus		SCMI	1416	PANICLED BULRUSH	Cyperaceae	G	0 9000	W	NP
Sitanion	hansenii		SIHA1	1506	HANSEN SQUIRRELTAIL	Poaceae	G	0 13000	CE GO S	NP
Sitanion	hystrix		SIHY	1506	SQUIRRELTAIL	Poaceae	G	0 13000	CE GO S	NP
Sitanion	jubatum		SIJU	1506	BIG SQUIRRELTAIL	Poaceae	G	0 10000	CE GO S	NP
Stipa	lepida		STLE2	1532	FOOTHILL NEEDLEGRASS	Poaceae	G	0 4000	C GO S	NP
Stipa	pulchra		STPU	1532	PURPLE NEEDLEGRASS	Poaceae	G	0 5000	C GO S	NP
Typha	domingensis		TYDO	1367	CAT-TAIL	Typhaceae	G	0 5000	F	NP
Typha	latifolia		TYLA	1367	COMMON CAT-TAIL	Typhaceae	G	0 5000	F	NP
Ferns										
Adiantum	jordani		ADJO	38	CALIF. MAIDENHAIR FERN	Pteridaceae	F	0 3500	CE RS	NP
Adiantum	pedatum	aleuticum	ADPEA	38	FIVE-FINGER FERN	Pteridaceae	F	0 10500	CE R	NP
Aspidotis	californica		ASCA1	35	CALIFORNIA LACE FERN	Pteridaceae	F	0 2500	E ORS	NP
Cheilanthes	covillei		CHCO2	34	COVILLE LIP-FERN	Aspidiaceae	F	1500 9000	C	NP
Cystopteris	fragilis		CYFR	43	BRITTLE or BLADDER FERN	Aspidiaceae	F	0 1000	E OR W	NP
Dryopteris	arguta		DRAR	42	COASTAL WOOD-FERN	Pteridaceae	F	0 5000	E ORS	NP
Pellaea	andromedaefolia		PEAN1	36	COFFEE FERN	Pteridaceae	F	0 4000	CE ORS	NP
Pellaea	mucronata		PEMU	36	BIRD'S-FOOT FERN	Pteridaceae	F	0 6000	CE O S	NP
Pityrogramma	triangularis		PITR	37	GOLDENBACK FERN	Pteridaceae	F	0 5000	E ORS	NP
Polypodium	californicum		POCA1	45	CALIFORNIA POLYPODY FERN	Polypodiaceae	F	0 4000	CE RS	NP
Polypodium	californicum	kaulfussii	POCAK		KAUFUS' POLYPODY FERN	Polypodiaceae	F	0 4000	CE RS	NP
Polystichum	munitum		POMU1	40	SWORD FERN	Aspidiaceae	F	0 2500	E R	NP
Pteridium	aquilinum	pubescens	PTAQP	31	BRACKEN FERN	Pteridaceae	F	0 10000	CE GORS	NP
Woodwardia	fimbriata		WOFI	44	CHAIN FERN	Blechnaceae	F	0 5000	E R W	NP

Appendix H

List of Rare, Threatened and Endangered Plants

Scientific Name **Common Name**	**Federal Status**	**State Status**	**CNPS Status**	**Habitat Type**	**Distribution by Park**
Acanthomintha lanceolata Santa Clara thorn mint	None	None	1-1-3 List 4	Chaparral (shale scree)	O S
Amsinckia grandiflora Large-flowered fiddleneck	FE	CE	3-3-3 List 1B	Annual grassland Oak woodland	Bd
Arctostaphylos auriculata Mt. Diablo manzanita	C3c	None	3-1-3 List 1B	Chaparral	Bd
Arctostaphylos pallida Alameda manzanita	C2	CE	3-3-3 List 1B	Chaparral	H Sr T
Aster chilensis var. lentus Suisun marsh aster	C2	None	2-2-3 List 1B	Marshes & swamps (brackish)	Bi
Calochortus pulchellus Mt. Diablo fairy lantern	None	None	1-1-3 List 4	Chaparral Oak woodland	B Df Dv Mt
Calochortus umbellatus Oakland star-tulip	None	None	1-1-3 List 4	Chaparral	Ac Lt O T W
Clarkia franciscana Presidio clarkia	C1	CE	3-3-3 List 1B	Coastal scrub	Ac R T
Cordylanthus mollis ssp. mollis Soft bird's-beak	C2	None	2-3-3 List 1B	Marshes & swamps (coastal salt)	Pp
Dirca occidentalis Western leatherwood	None	None	1-2-3 List 4	Chaparral, Mixed evergreen forest	Ac Cc H L R T W
Eriogonum caninum Tiburon buckwheat	C3c	None	1-2-3 List 4	Annual grassland Chaparral	R
Erysimum capitatum var. angustatum Contra Costa wallflower	FE	CE	3-3-3 List 1B	Inland dunes	Bi
Fritillaria liliacea Fragrant fritillary	C2	None	1-2-3 List 1B	Annual grassland Coastal scrub	Df T
Helianthella castanea Diablo helianthella	C2	None	3-2-3 List 1B	Chaparral, Mixed evergreen forest	Ac Bd Cs Lt Mt
Hesperolinon breweri Brewer's dwarf flax	C2	None	3-2-3 List 1B	Annual grassland Chaparral	Bd
Holocarpha macradenia Santa Cruz tarplant	C1	CE	2-3-3 List 1B	Annual grassland	W (introduced)
Juglans hindsii Northern California black walnut	C2	None	3-3-3 List 1B	Riparian forest Riparian woodland	Lt

Scientific Name Common Name	Federal Status	State Status	CNPS Status	Habitat Type	Distribution by Park
Lathyrus jepsonii ssp. jepsonii Delta tule pea	C2	None	2-2-3 List 1B	Marshes & swamps (brackish)	Bi Mw
Lilaeopsis masonii Mason's lilaeopsis	C2	CR	2-2-3 List 1B	Marshes & swamps (brackish)	Bi
Malacothamnus hallii Hall's bush mallow	None	None	1-1-3 List 4	Chaparral	Bd
Oenothera deltoides ssp. howellii Antioch Dunes evening primrose	FE	CE	3-3-3 List 1B	Inland dunes	Bi
Quercus lobata Valley oak	None	None	1-2-3 List 4	Oak woodland Riparian Forest	Widespread
Ranunculus lobbii Lobb's aquatic buttercup	None	None	1-2-3 List 4	Grassland Oak woodland	Wildcat Canyon

Abbreviations Used

Federal Status

C1 = Enough data are on file to support the federal listing
C2 = Threat and/or distribution data are insufficient to support federal listing
C3c = Too widespread and/or not threatened
FE = Federally listed, endangered

State Status

CE = State listed, endangered
CR = State listed, rare

CNPS Status (R-E-D, List)

CNPS = California Native Plant Society

R (Rarity)

1- Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time
2- Occurrence confined to several populations or to one extended population
3- Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported

E (Endangerment)

1- Not endangered
2- Endangered in a portion of its range
3- Endangered throughout its range

D (Distribution)

1- More or less widespread outside California
2- Rare outside California
3- Endemic to California

List 1B

Plants that are rare or endangered in California and elsewhere

List 4

Plants of Limited Distribution (a Watch List)

Distribution by Park

Ac	Anthony Chabot
B	Briones
Bd	Black Diamond Mines
Bi	Brown's Island
Cc	Claremont Canyon
Cs	Carquinez Straits
Df	Diablo Foothills
Dv	Del Valle
H	Huckleberry
L	Leona
Lt	Las Trampas
Mt	Morgan Territory
Mw	Martinez Waterfront
O	Ohlone
Pp	Point Pinole
R	Redwood
Ro	Roberts
S	Sunol
Sr	Sobrante Ridge
T	Tilden
W	Wildcat Canyon