*Q. lobata* is endemic to California. Once widespread, *Q. lobata* now occupies only 2.7% of the state. The woodland has a patchy distribution adjacent to most major lowland valleys with deep soils below 740 m. The patches are embedded in a matrix of agricultural, urban, annual grasslands, riparian forests, and other oak woodland types. Conversion of *Q. lobata* to irrigated agricultural land has had the largest effect on the acreage decline of this type. *Q. lobata* woodlands vary from open savannas to closed-canopy forests. Dense stands occur along natural drainages with deep soils. Density decreases as one moves from lowlands to uplands. The understory shrub layer can be dense along drainages but very sparse in uplands.

Q. wislizeni and Q. douglasii are common associates of Q. lobata communities. In riparian forests, associates include *Platanus racemosa, Juglans hindsii, Acer negundo, Populus fremontii, Salix,* and *Fraxinus latifolia*.

Q. lobata are among the oldest and largest oaks in North America. Tree age can exceed 500 years. In many areas, there is little valley oak recruitment, due to both natural and human causes. Mortality of oak saplings seems to be related to competition for moisture with grasses and forbs, wild and domestic animals feeding on acorns and seedlings, and flood control. Fire suppression has encouraged evergreen oak and pine invasion in upland Q. lobata sites.

Q. douglasii woodlands form a nearly continuous band along the Sierra Nevada foothills, typically between 300 and 760 m in elevation. At lower elevations on gentle slopes, Q. douglasii woodlands typically occur as large blocks with highly variable canopy cover. On steeper ground, blue oak woodlands occur in small patches within other vegetation such as annual grasland, chaparral, riparian forest, and other types of oak woodland.

Q. douglasii woodlands occur on a wide range of soils; however, they are often shallow, rocky, infertile, and well drained. P. sabiniana, Aesculus californica, valley oak, interior live oak, canyon live oak, and Q. kelloggi are common associates. The overstory of Q. douglasii woodland ranges from sparsely scattered trees on poor sites to nearly closed canopies on good quality sites.

Annual grasses create most of understory cover in open woodlands. Common species include Bromus, Lolium, and Hordeum. Common forbs include Daucus, Geranium, Madia, and Trifolium. Characteristic shrub species include Toxicodendron diversilobum, Rhamnus, and several species of Ceanothus and Acrtostaphylos.

Blue oaks are relatively slow-growing, long-lived trees endemic to California. Most blue oak stands exist as roups of medium-to-large trees with fe or no young oaks. There is concern that blue oak woodlands may be slowly changing into savannas and grasslands as trees die and are not replaced. Fire is and important environmental factor because young blue oaks can stump sprout readily, but older, decadent trees cannot. Therefore, younger stands are more likely to regrow after fires.

Poor blue oak recruitment from acorns occurs for several reasons. Introduced annual grasses outcompete blue oak seedlings for soil moisture. In addition, acorns and seedlings are eaten or damaged by insects, domiestic livestock, and wildlife. BO also appears to be somewhat intolerant of shade and is unable to survive under dense overstory canopies. Most recent work suggests that recruitment is not limited by reproductionn, but by the establishment and survival of saplings.

Blue oak trees have a significant effect on understory composition and productivity depending on density of oak species and annual precipitation. Where precipitation higher, the canopy suppresses understory biomass throughout the growing season. On direr sites, the opposite effect occurs. Grassland productivity under blue oak canopies can be twice that of open grassland.

*Q. douglasii-P. sabiniana* woodlands are found on steeper, drier slopes with shallower soils than Q. douglasii woodlands. At lower elevations on gentle slopes, these two communities intermix with grasslands. At higher elevations on steeper slopes, the communities are mixed with grasslands and shrublands. Riparian woodlands may bisect these mosaics along permanent and intermittent watercourses. *Q. douglasii-P. sabiniana* woodlands are found throughout the range of blue oak and form a nearly continuous band along the Sierra Nevada foothills. The upper elevation limit is around 150 m. This woodland type occurs on a variety of well-drained soils.

P. sabiniana is taller and dominates the overstory, but is shorter-lived (at approximately 80 years) than blue oak (150-250 years). Blue oak is usuually the more abundant of the two trees, but P. sabiniana contributes as much basal area as Q. douglasii. In the Sierra Nevada foothills, interior live oak and California buckeye may be associated with foothill pine and blue oak. Interior live oak becomes more abundant on steeper sloeps, shallower soils, and at higher elevations. Shrub assocaites include several ceanoothus and manzanita species, point onak, and Cercis occidentalis, and they are usually clumped in areas of full sunlight. *Q. douglasii-P. sabiniana* woodlands have a diverse mix of hardwoods, conifers, and shrubs, and widely variable overstories.

Foothill pine tends to grow faster than blue oak; thus it is important in the patch of succession. Historically, fire was a frequent occurrence. Foothill pine and blue oak are both adapted to fire, with cones remianing on the pine for several years, and vigorous sprouting in young oaks after fire. Younger stands of oaks are more liekly to replace themselves after fires, whereas foothill pine must depend on regeneration from seed.

The pre-European herbaceous oak woodland understory included native perennial bunhcgrasses, annual grasses and annual and perennial forbs.

Annual grassland is the major understory vegetation, although shrubs and perennial grasses may be important components in some areas. Oak-dominated communities are bounded by grasslands at lower elevations and conifer forests at higher elevations.

Oak savannas and woodlands are generally 60-700 m elevation.