

List of Habitats and their Dominant Shrubs in the Tulare Region

Allscale Series

This upland habitat features carbonate-rich or sandy soils in old beach and lake deposits, alluvial fans and rolling hills. Alkali saltbush (*Atriplex polycarpa*), bladderpod (*Isomeris arborea*), paleleaf goldenbush (*Isocoma acradenia*), and saltgrass (*Distichlis spicata*) dominate these sites. Shrubs grow less than three meters high, with a canopy ranging from continuous to open. The California Natural Diversity Database (CNDDDB) tracks this rare habitat as Great Valley allscale scrub.

Large stands of this habitat remain throughout the Tulare Basin; some protected in public reserves. Easily restored, restoration techniques for the allscale series succeed under most conditions (see Bureau of Land Management's (BLM) Atwell Island Project for restoration examples). Re-establishing this habitat will enlarge existing patches and create significant connections between habitat areas for wildlife.

Bladderpod - California Ephedra - Narrowleaf Goldenbush Scrub

This upland habitat features bladderpod California ephedra (*Ephedra californica*), narrowleaf goldenbush (*Ericameria linearifolia*), alkali goldenbush (*Isocoma acradenia* var. *bracteosa*), California buckwheat (*Eriogonum fasciculatum*), and slender buckwheat (*Eriogonum gracillimum*). Shrubs grow less than three meters high, with an open canopy and grassy ground cover, on soils derived from diatomaceous deposits, sand, or shale.

Poso Creek, Caliente Creek, and Arroyo Pasajero host substantial areas of this habitat. It is not clear whether this habitat was historically more widespread. While conservation measures protect some areas, most of this habitat is not protected. Some areas could be restored to native conditions; in other places, improved range management will greatly help this habitat.

Bush Seepweed Series

Found on old lake beds or plains, saline water intermittently floods or saturates this wetland habitat. Bush seepweed (*Suaeda moquinii*), alkali heath (*Frankenia salina*), alkali sacaton (*Sporobolus airoides*), alkali saltbush, and iodine bush (*Allenrolfea occidentalis*) dominate these sites. Shrubs grow less than one-and-a-half meters high, with an open canopy. CNDDDB tracks this rare habitat as Great Valley bush seepweed scrub.

Significant patches of this habitat remain in the Tulare Basin, under a variety of ownerships. Easily restored, there are extensive opportunities for re-establishing the bush seepweed series throughout this area. Unique wildlife species, such as Tipton kangaroo rat and California horned

lizard (*Phrynosoma coronatum*), colonized restoration sites within a year of planting at the BLM's Atwell Island Project. In addition, the unique and rare San Joaquin tiger beetle (*Cicindela tranquebarica*), utilizes this specific habitat to survive.

Buttonbush Series

Found in floodplains, freshwater intermittently to seasonally floods this wetland habitat. Buttonbush (*Cephalanthus occidentalis*) and willows (*Salix* spp.) dominate, growing less than 10 meters high in a continuous to open canopy. CNDDDB tracks this rare habitat as buttonbush scrub.

Very little of this habitat type remains in the Tulare Basin. Currently, restoration techniques for the buttonbush series are being explored to maximize re-establishment opportunities along water distribution channels, such as ditches and canals, and in managed/developed wetlands.

California Rose Riparian Scrub

Dominated by California wild rose (*Rosa californica*), this wetland habitat can be found either with or without an open wooded overstory. Soils range from streamside alluvial deposits to moist hillsides. This habitat is uncommon throughout the Tulare Basin, with a few examples along the Fresno Slough, Kings River, Kaweah River, Tejon Creek, and El Paso Creek. Restoration techniques are well understood, providing great opportunities for restoration along creeks, in developed wetland areas, and along irrigation ditches and canals.

Iodine Bush Series

Found in dry lake beds, lake margins, hummocks, and seeps, hypersaline water intermittently floods or saturates this wetland habitat. Iodine bush, alkali heath, alkali sacaton, bush seepweed, and saltgrass dominate, growing less than two meters high with a continuous to open canopy. Of particular note, iodine bush only reproduces when flooded during the appropriate season. CNDDDB tracks this rare habitat as Great Valley iodine bush scrub.

A number of existing stands of the iodine bush series inhabit the Tulare Basin. Conservation owners manage some areas, while others remain a high conservation priority. Restoration techniques for this habitat type area being developed with some success at BLM's Atwell Island Project. There are extensive opportunities to re-establish the iodine bush series on degraded grasslands and unproductive farmlands.

Mexican Elderberry

Blue elderberry (*Sambucus nigra* ssp. *caerulea*) dominates this wetland habitat, which is intermittently or seasonally saturated with fresh water. California wild grape (*Vitis californica*), narrow-leaved willow (*Salix exigua*), and poison oak (*Toxicodendron diversilobum*) may also be

present. Shrubs grow less than eight meters high with a continuous to open canopy and grassy ground cover.

Found in only a few locations along corridors flowing into the Tulare Basin, the best examples of this habitat are located along the Kings River upstream from the City of Reedley, Kaweah River, and Poso Creek. Restoration techniques are well understood, providing great opportunities for restoration along creeks, in developed wetland areas, and along irrigation ditches and canals.

Mulefat Series

Fresh water seasonally floods or saturates this wetland habitat. Found along irrigation ditches and stream channels, this habitat hosts mulefat (*Baccharis salicifolia*), arroyo willow (*Salix lasiolepis*), and narrowleaf willow, which grow less than four meters high in a continuous canopy. CNDDDB does not track this habitat.

Few existing stands of the mulefat series remain, located mostly on public land scattered across the Tulare Basin. Restoration techniques for this habitat type are well understood, providing numerous opportunities to re-establish the mulefat series in developed wetland areas and along irrigation ditches and canals.

Quailbush Scrub

Found in small stands less than four meters high bordering managed fields and intermittently flooded wetlands, quailbush (*Atriplex lentiformis*) dominates this habitat, which also includes non-native annual grasses and non-native herbs. This habitat type, represented in the Tulare Basin by the big saltbush-allscale plant association, is newly described and not tracked by CNDDDB.

A few existing stands of the quailbush series remain in the Tulare Basin. Restoration techniques for this habitat type are well understood, providing numerous opportunities to re-establish quailbush scrub in developed wetland areas and along irrigation ditches and canals.

Scalebroom Scrub

Scalebroom (*Lepidospartum quamatum*), bladderpod, brittlebush (*Encelia farinosa*), cheesebush (*Hymenoclea salsola*), mulefat, and California buckwheat dominate this upland habitat. Shrubs grow less one and half meters high with a continuous or intermittent canopy. Found in low gradient deposits along streams, these sites are rarely flooded. The CNDDDB tracks this rare habitat.

This habitat is scarce along the corridors around the Tulare Basin and is most common in Kern County along San Emigdio Creek, Poso Creek, and Caliente Creek; Arroyo Pasajero (Fresno County) hosts this habitat as well. It is unlikely that this habitat was historically more widespread than at present. Little is known about restoring scalebroom scrub and high-intensity grazing may

have an adverse effect. Developing restoration techniques and improving range management could help preserve this rare habitat.

Silver Bush Lupine Scrub

Silver bush lupine (*Lupinus albifrons*) dominates this upland habitat. Sites can be found either with or without an open wooded overstory in soils ranging from streamside boulder fields to alluvial deposits to hillsides. Extremely rare in the Tulare Basin, the only large expanses occur along the Kings River near Avocado Lake and the Kaweah River in the vicinity of aggregate mine operations near McKay Point. It is not known if this habitat was historically more common than it is at present and little is known about its restoration.

Spinescale Series

An incredibly unique habitat, the spinescale series features both wetlands and uplands. In dry lake beds and plains, saline water intermittently floods the wetland portion; in the adjacent uplands, alluvial fans and old lake beds host this habitat. Spinescale (*Atriplex spinifera*), alkali saltbush, alkali heath, and saltgrass dominate, with shrubs growing less than two meters high in an open canopy. CNDDDB tracks this rare habitat as Great Valley spinescale scrub.

This type of intermediate habitat hosts a variety of special plants and animals, uniquely adapted to survive in changing conditions. Conservation strategies for the few remaining stands will enable the plants and animals that depend on this habitat to survive. Spinescale, a key plant species in this habitat, has low seed viability; additional research on this plant's reproduction will contribute to a better understanding about the conditions under which viable seed germinates, which in turn, will contribute to successful restoration projects in the Tulare Basin in the future.

Tamarisk Series

Fresh water intermittently floods or saturates this wetland habitat, found along ditches, washes and level floodplains. Tamarisk (*Tamarix* spp.), quailbush, and willows dominate, with the non-native saltcedar (*Tamarix ramosissima*) being the most common tamarisk in this part of California. These shrubs grow less than five meters high in a continuous to open canopy, sometimes scattered with emergent trees. CNDDDB does not track this habitat.

Many of the canals, waterways, and floodplains in the Tulare Basin have been colonized and taken over by this invasive non-native, with numerous and extensive stands found throughout the area. Controlling and eradicating saltcedar is a high priority; stands should be replaced with native vegetation such as willows, buttonbush, mulefat, and other riparian shrubs and trees. In spite of the fact that this is an invasive non-native tree, large tricolored blackbird (*Agelaius tricolor*) colonies have been discovered in tamarisk groves where the Kern River crosses Sand Ridge at the south edge of the Tulare Lake bed.

Note: The habitat description for California rose riparian scrub and silver bush lupine scrub follow the California Natural Diversity Database. The description for quailbush scrub follows the List of California Terrestrial Natural Communities described by the California Department of Fish and Game's wildlife habitat data analysis branch, September 2003. The remaining habitat descriptions follow *A Manual of California Vegetation*, by J.O. Sawyer and T. Keeler-Wolf, 1995, which defines habitats based on the plant associations found in a series or particular plant community.