Ecological site group R014XG922CA
Clayey Upland

Last updated: 09/07/2023
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Key Characteristics

None specified

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Physiography

This ESG is typically found on complex undulating, rolling to steep uplands with slopes of 5 to 50 percent. Elevations are 25 to 3,000 feet.

Climate

The average annual precipitation in this area is 11 to 53 inches (272 to 1,353 millimeters). The higher amounts of precipitation occur at the higher elevations in the area north of San Francisco. Most of the rainfall occurs as low- or moderate-intensity, Pacific frontal storms during winter. This area is very dry from midspring to midautumn. Snowfall is rare. The average annual temperature is 54 to 61 degrees F (12 to 16 degrees C). The freeze-free period averages 315 days and ranges from 265 to 365 days. It is longest near the coast, and it becomes shorter with elevation.

Soil features

Soils in this ESG soils are deep, well drained soils that formed in colluvium and residuum from ultramafic and serpentine materials and shale. The soils are silty clay and clay textures and clay horizons have slickensides.

Some representative soils include:

Diablo, a fine, smectitic, thermic Aridic Haploxerert
Santerhill, a fine, magnesic, thermic Aridic Haploxererts

Vegetation dynamics

This ESG covers the areas of the valleys in MLRA 14 that were at one time part of a vast complex of oak savannahs, meadows, perennial native grasslands. The urbanized landscape in the valleys within this MLRA that exists today makes it difficult to imagine the natural landscape prior to human development.

These clayey upland areas that received significant spring water run-on from upslope watershed water or from springtime flooding. Once the area began to be settled, much of this site was drained, leveed, cleared for crops and other agriculture, and urbanized.

As this landscape was de-watered and houses and agriculture took over, the water table for many of these habitats moved deeper and deeper, creating soils that would no longer offer the available soil moisture for many of the plants that had evolved with the hydrologic function of the natural system that no longer existed. These slowly drained clayey soils would have transitioned rather slowly to an altered state with the removal of the yearly groundwater sources, due to higher water holding capacities during most of the growing season. The finer clay textures will harden as they dry out through both drainage and evapotranspiration in the summer months making them less

hospitable for many of the native plants and more dominated by annual grasses and forbs, the higher water-holding clays will be slightly more resilient. Annual production will vary depending on the soil texture and proximity to groundwater sources.

Historically, this site may have looked similar to the CWHR native perennial grasslands and/or oak savannahs, however with the introduction of non-native annual grasses and the impacts from fragmentation, extensive agriculture, continued de-watering, and human alterations such as homes and roads, this site now reflects a lower producing, dry, annual grassland.

Currently, where this site is not under cultivation or urban developments, it is dominated by non-native annual grasses and oaks. These include wild oats, soft chess, ripgut brome, red brome, wild barley, and foxtail fescue. Common forbs include broadleaf filaree, redstem filaree, turkey mullein, true clovers, bur clover, popcorn flower, and many others. Perennial grasses will be found in moist, lightly grazed, or relic prairie areas. Species composition is also related to water availability with greater amounts of relic perennial grasses in areas of greater precipitation or soil moisture.

Information from:

John G. Kie
California Wildlife Habitat Relationships System
California Department of Fish and Game
California Interagency Wildlife Task Group

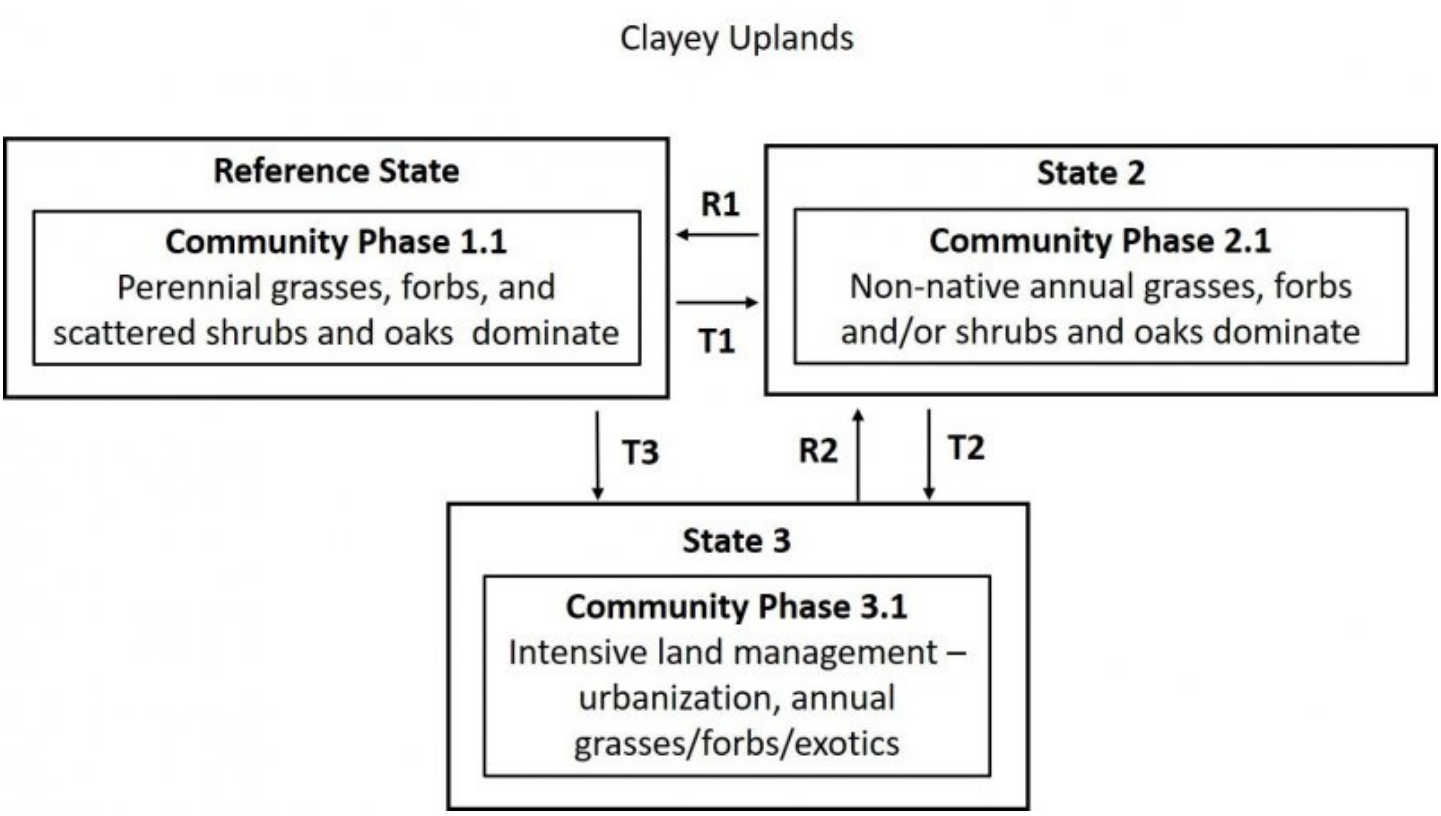
Major Land Resource Area

MLRA 014X
Central California Coastal Valleys

Stage

Provisional

State and transition model



Reference State

This ESG represents the clayey upland soils that were dominated by native perennial grasslands and scattered shrubs and oaks. The single most important characteristic of these clayey soils that have high soil moisture, fertile soils, but also dry out easily and become hard. Seasonality and reliability of precipitation will largely determine the vegetational stability and expression.

Reference State Community Phase

Community 1.1 This reference community phase is dominated by a mixture of perennial grasses and forbs and some shrubs and scattered oaks that vary depending on what the water source is and where the site is located across the landscape.

State 2 Community Phase

Community 2.1 This community represents the mix of native perennial grasses, non-native annual grasses and forbs that are able to withstand the drying out periods that occur during the warm summer months. There may be some scattered shrubs and trees, depending on the soil type and location on the landscape that allows for greater soil moisture during summer temperatures.

State 3 Community Phase

Community 3.1 - This community phase represents all the varied land uses that significantly alter this ecological site. This is an extremely varied community phase that includes all types of alterations that so significantly alter the ecological site that it is permanently changed and no longer has typical or even representative ecological dynamics.

Transitions

T1 This transition is caused by alterations to soil moisture availability and a disturbance that impacts the vegetation. Typical disturbances would be fires and prolonged droughts and wildlife grazing. After settlement occurred disturbances included livestock grazing, urbanization and fragmentation, associated sites being leeved, and channelized for irrigation needs that allowed for the invasion of non-native annual plants that are able to take advantage of a stressed habitat and/or times of consecutive drought that may stress the native species making them vulnerable to a threshold crossing event that shifts feedbacks in support of the non-native annuals.

R1 This restoration pathway occurs when significant time and money inputs are focused on addressing the hydrologic functions that existed historically in order to return the water table that once supported perennial grasses and grass-likes.

T2 This transition is caused by significant human alterations that remove essential topsoil horizons, alter hydrologic functions, and/or add significant inputs that change soil chemistry and soil properties for housing developments, urban infrastructures or intensive cropping systems and force this ecological site over a threshold and change the function and structure of this site in extensive ways.

R2 This restoration pathway occurs only when significant time and money inputs are focused on returning ecological functions and processes.

T3 This transition is caused by significant human alterations that entirely removes essential topsoil horizons, alters hydrologic functions, and/or add significant inputs that change soil chemistry and soil properties for housing developments, urban infrastructures or intensive cropping systems and force this ESG over a threshold and change the function and structure of this site in extensive ways.

Citations