Soils and Plants: A Way to Read the Landscape

Kerry D. Arroues

If you look at hills sometimes you see chaparral stopping in an abrupt line and grassland beginning as if someone had cleared away the shrubs. You may notice trees growing exclusively on certain slopes. Many factors influence plant growth such as north-south exposure, fire, and human intervention. Soil is one of the principal factors not often considered. If you learn to recognize soil characteristics that affect plant growth you can more easily predict which native plants are likely to be growing there.

The soil survey map is an aid to predicting native plants. Soil scientists observe the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rocks; temperature and precipitation zones; elevation ranges; and many facts about the soils. Great differences in soil properties can occur within short distances. The differences between soil characteristics that soil scientists observe give them an opportunity to see correlations between plants and soils.

As a soil scientist in Kings and Western Fresno Counties, California, I have seen many correlations between specific soils and specific plants. By looking at a Soil Survey you can make use of soil information to locate specific plants. One such correlation occurs in the eastern part of the Coast Range of Kings County where several distinct types of vegetation occur within 2 miles of each other. The soils under each vary in several characteristics and are similar in others. (Two examples are site A and site B.)

Site A and Site B

The soils on both sites A and B are on northwest-facing slopes. Both soils were formed from sedimentary rock, predominantly sandstone. Both soils also have 4 in. of sandy loam-textured soil over the sandstone. Site A (Fig. 1) is located near Garza Peak, at 2,600 ft. on a 50% slope. Site B (Fig. 2) is located 2 miles northwest of Garza Peak at 1,900 ft. on a 30% slope. The soil pH on site A is 7.7 to 8.0, which is mildly to moderately alkaline. Lime (CaCO₃) is present throughout the soil on site A. Site B has a pH of 7.1 to 7.3, which is neutral. No lime is present on this site.

The plant cover of site A is composed of 40% black sage (Salvia mellifera); 20% California buckwheat (Eriogonum fasciculatum); 5% woolly yerba santa (Eriodictyon trichocalyx var. tomentosum); and small amounts of chaparral yucca (Yucca whipplei), California sagebrush.

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2 Soil survey party leader, USDA-SCS, 823 West Lacey Blvd., Hanford, CA 93230.