

Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin

MLRA Explorer Custom Report

D - Western Range and Irrigated Region
22A - Sierra Nevada Mountains

MLRA 22A - Sierra Nevada Mountains



Figure 22A-1: Location of MLRA 22A in Land Resource Region D

Introduction

This area (shown in fig. 22A-1) is in California (98 percent) and Nevada (2 percent). It makes up about 18,810 square miles (48,745 square kilometers). It has a few large communities. Quincy, South Lake Tahoe, and Truckee, California, are in this MLRA. The smaller communities include Markleeville, Colfax, and Kernville. Interstate 80 crosses the center of this area. Yosemite and Sequoia-Kings Canyon National Parks occur in the area. A major portion of this MLRA is in national forests, including the Eldorado, Inyo, Plumas, Sierra, Sequoia, Stanislaus, and Tahoe National Forests. Numerous Indian reservations are in the MLRA, including the Berry Creek Rancheria, Enterprise Rancheria, Greenville Rancheria, Jackson Rancheria, Sheep Ranch Rancheria, and Tuolumne Rancheria Reservations.

Physiography

This MLRA lies entirely within the Sierra Nevada Section of the Cascade-Sierra Mountain Province of the Pacific Mountain System. This area consists of the higher elevations of the Sierra Nevada Mountains. It is a strongly asymmetric mountain range with a long, gentle western slope and a steep eastern escarpment. It is characterized by hilly to steep mountain relief and occasional mountain valleys. It is 50 to 80 miles (80 to 130 kilometers) wide and runs in an approximately north-south direction through eastern and central California for more than 400 miles (645 kilometers).

Elevation ranges from 1,500 to 9,000 feet (455 to 2,745 meters) in most of the area. The highest peaks can exceed 12,000 feet (3,660 meters). Mount Whitney, at an elevation of 14,494 feet (4,419 meters), is the highest point in the lower 48 States. The strongly sloping to precipitous mountains have unstable slopes and sharp crests. Valleys are typically narrow and are filled with alluvium.

Almost all of the valleys have streams with actively eroding banks.

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Sacramento (1802), 31 percent; San Joaquin (1804), 31 percent; Tulare-Buena Vista Lakes (1803), 20 percent; Central Lahontan (1605), 10 percent; Northern Mojave-Mono Lake (1809), 7 percent; and North Lahontan (1808), 1 percent. The American, Carson, Kern, San Joaquin, Truckee, Walker, and Yuba Rivers originate in this area.

Geology

Most of this area is dominated by plutonic (dominantly quartz monzonite and granodiorite) rocks of Mesozoic age, otherwise known as the Sierra Nevada Batholith. The north half of the range is flanked on the west by the western metamorphic belt, an area of strongly deformed and metamorphosed sedimentary and volcanic rocks of Paleozoic and Mesozoic age. Farther south, some of these metamorphic rocks are within the batholith on the western edge or along the crest of the range. Volcanic activity of minor extent has produced Miocene-age lava flows. The valleys are filled with relatively coarse alluvium since most of the sediments have not moved far from their source.

Gold occurs as lode deposits in Mesozoic metamorphic rocks of the western foothills, where heat generated from the intrusion of the Sierra Nevada Batholith mobilized and concentrated the gold in quartz veins. The most productive districts are in the "Mother Lode" belt in the northern and central parts of the Sierra Nevada Mountains. Placer deposits of gold, which accounted for more than 40 percent of California's total gold output, are in Tertiary stream gravel in the northwestern part of the Sierra Nevada Mountains and in recent stream channels where gold-bearing rocks eroded from areas near the Sierran crest are transported towards the valleys of the Sacramento and San Joaquin Rivers.

Pleistocene to Recent glaciers have shaped the Sierra Nevada Mountains by scouring outcrops, U-shaped valleys, and other glacial erosional features, depositing poorly sorted till in glacial moraines and influencing streamflow patterns by contributing variable amounts of runoff and periodically forming ice dams and lakes. The intermontane valleys are filled with coarse glacial deposits and with coarse alluvium since most of the deposits have not moved far from their source.

Climate

The average annual precipitation is 40 to 80 inches (1,015 to 2,030 millimeters) in much of this area, but it is as low as 6 inches (150 millimeters) in the lower valleys and foothills and as much as 100 inches (2,540 millimeters) on the mountain peaks. The amount of precipitation increases with elevation and from south to north. Summers are dry, but there are occasional thunderstorms. Much of the winter precipitation occurs as snow. The average annual temperature is 25 to 63 degrees F (-4 to 17 degrees C), decreasing with elevation. The freeze-free period averages 205 days and ranges from 65 to 345 days, decreasing in length with elevation. It is longest at the lower elevations along the western edge of the area.

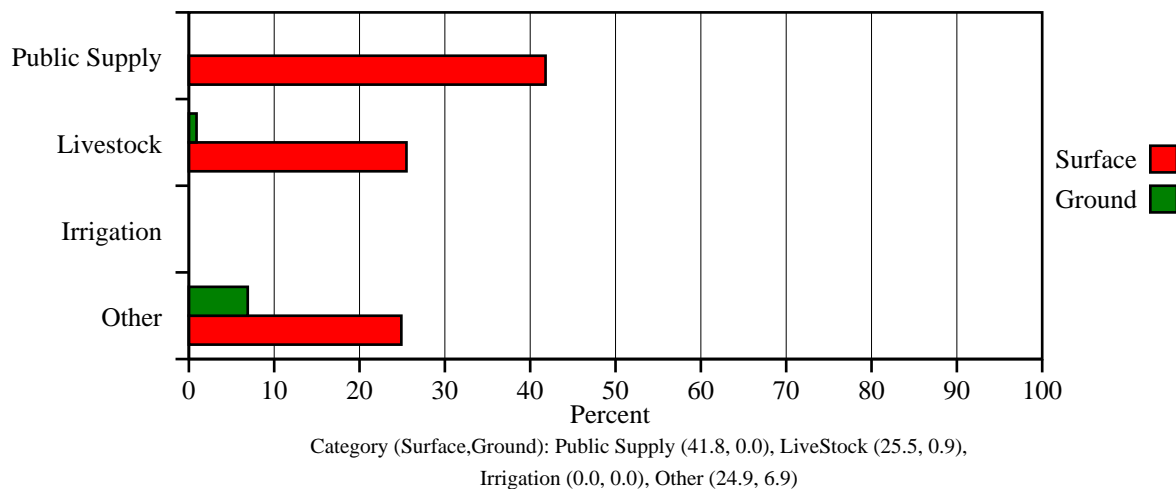
Water

The total withdrawals average 2 million gallons per day (8 million liters per day). About 8 percent is from ground water sources, and 92 percent is from surface water sources. The abundant rainfall and snowfields on the higher mountain slopes provide water for forestland and rangeland. Also, they meet part of the water needs of the lower adjacent areas by supplying water to many perennial rivers. Much of the water is stored in large reservoirs and is used in the valleys of the Sacramento and San Joaquin Rivers and in heavily populated southern California. Most of the public water supplies are obtained from surface water. This water is of good quality and is suitable for drinking after minimal treatment. The mountains provide opportunities for recreation to many people in California and to visitors from other States. There have been problems with fecal

coliform and Giardia contamination in the surface water at high elevations.

There are no principal aquifers in the Sierra Nevada Mountains. Some ground water is obtained from alluvium on valley floors. The fractures and joints in bedrock are the only other sources of ground water. The ground water is suitable for almost all uses, but it is little used in this area.

MLRA 22A Water Use by Category



Soils

The dominant soil orders in this MLRA are Alfisols, Entisols, Inceptisols, Mollisols, and Ultisols. The soils in the area dominantly have a mesic, frigid, or cryic soil temperature regime, depending largely on elevation; a xeric soil moisture regime; and mixed mineralogy. They generally are very shallow to deep, well drained or somewhat excessively drained, and loamy or sandy. The dominant soils in the MLRA formed in residuum and colluvium on hills and mountains.

The soils at elevations below 3,900 to 4,900 feet (1,190 to 1,495 meters) include deep or very deep Haplohumults (Sites and Aiken series), Haploxeralfs (Secca, Holland, and Cohasset series), Haploxerults (Josephine series), and moderately deep Haploxerults (Mariposa series), all of which formed in material weathered from metavolcanic and metasedimentary rocks. Deep and very deep Dystroxerepts (Chaix and Shaver series) formed in material weathered from granodiorite.

At the higher elevations, deep and very deep Haploxeralfs (Holland and Musick series), Xeropsamments (Cagwin, Corbett, and Toiyabe series), and Dystroxerepts (Meeks series) formed in material weathered from granodiorite and Dystroxerepts (Umpa series), Haploxerands (Meiss series), and Vitrixerands (Waca and Windy series) formed in material weathered from andesite. Large areas of rock outcrop are throughout the MLRA. They are on broad expanses on ridge crests and peaks above timberline, at an elevation of 7,875 to 8,850 feet (2,400 to 2,700 meters).

The soils in mountain valleys formed in mixed alluvium. They include Dystroxerepts (Gefo and Jabu series), Argicryolls (Macareno series), and Haploxeralfs (Inville series).

Biology

This area supports montane coniferous forest vegetation. The main species are ponderosa pine, Douglas-fir, incense cedar, sugar pine, white fir, California red fir, Jeffrey pine, lodgepole pine, and mountain hemlock. Bristlecone pine grows in protected draws at elevations above 8,850 feet (2,700 meters). Bluegrass, hairgrass, sedges, wiregrass, clovers, and wild iris grow in montane meadows. Manzanita, sagebrush, blue wildrye, fescues, bluegrasses, and mountain brome are common understory species in open stands of timber.

Some of the major wildlife species in this area are black-tailed deer, mountain lion, bighorn sheep, coyote, bobcat, gray fox, raccoon, skunk, jackrabbit, gray squirrel, rattlesnake, California condor, turkey vulture, roadrunner, crow, quail, band-tailed pigeon, and blackbird. The species of fish in the area include rainbow, brown, brook, cutthroat, and golden trout, anadromous salmonids, and northern pike minnow.

Land Use

About three-fourths of this area is federally owned land, which is primarily in national forests and parks. The rest of the area is privately owned forestland, farms, and ranches. About 83 percent of the area is forestland used for timber, recreation, wildlife habitat, and watershed. Approximately 7 percent is pasture or range. The area has very little cropland. The cropland is used mainly for deciduous fruits, grain, or hay. Livestock grazing is confined to mountain meadows, which are grazed during summer, and to areas with open stands of timber.

The major resource management concerns on upland soils at intermediate elevations are low pH (moderate or strong acidity) and fertility. The uplands are hilly to mountainous and are subject to erosion in areas where the soils are disturbed by logging, fires, overgrazing, or cultivation. The hazard of erosion is highest on the moderately coarse textured, granitic soils. In areas of shallow soils, soil depth and a low available water capacity are limitations.

The upland soils at high elevations have severe climatic limitations. They also have low pH (moderate or strong acidity) and fertility. Erosion is a hazard in areas on these high-elevation, mountainous slopes where the soils are disturbed by fires and logging operations. Most of the soils are stony and have a low available water capacity.

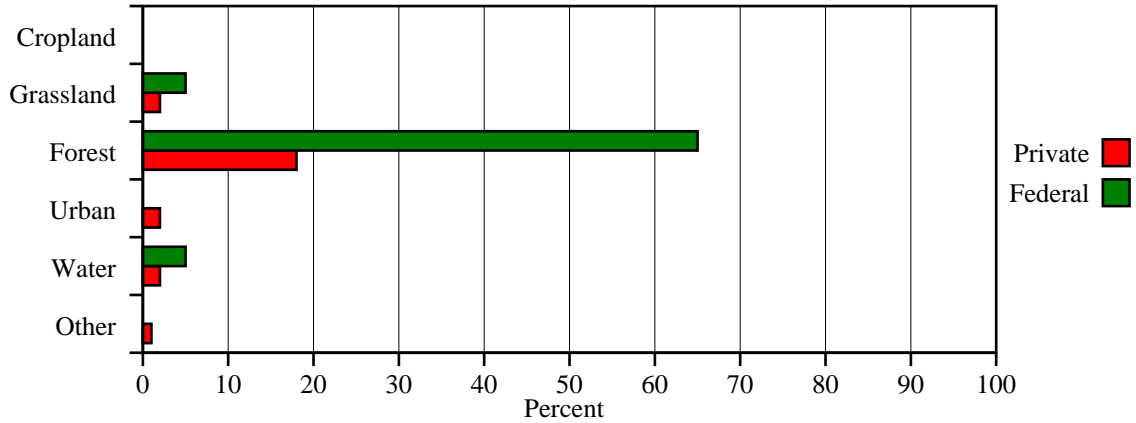
In the mountain valleys, water management is needed to prevent stream downcutting and gullying and to maintain a satisfactory moisture condition for the growth of desirable plant species. Drainage can be a problem in many of the soils. Preventing or controlling wild-land fires is a major management concern. Older or improperly designed roads contribute sediment to streams. Other management concerns include compaction resulting from farming activities, the impacts of catastrophic wildfire on forestland, and maintenance of the content of organic matter in the soils.

Conservation practices on all kinds of land in this MLRA include measures that control erosion on access roads and measures that protect riparian areas. The most important conservation practices on forestland are those that improve forest health, reduce the chance of catastrophic wildfire, and protect wildlife habitat. These practices include tree and shrub establishment, forest stand improvement, forest harvest trails and landings, critical area planting, and reduction of the extent of understory fuels.

Conservation practices on cropland and pasture generally include irrigation water management, water-control structures, protection of riparian areas, control of streambank erosion, and nutrient and pesticide management. Prescribed grazing, fences, and water management are the most important practices on rangeland and other grazing land.

Conservation practices in rapidly expanding areas used for urban development generally include properly designing roads, improving forest health, and reducing the chance of catastrophic wildfire and thus protecting wildlife habitat.

MLRA 22A Land Use by Category



Category (Private,Federal): Cropland (0.0, 0.0), Grassland (2.0, 5.0), Forest (18.0, 65.0),
Urban (2.0, 0.0), Water (2.0, 5.0), Other (1.0, 0.0)