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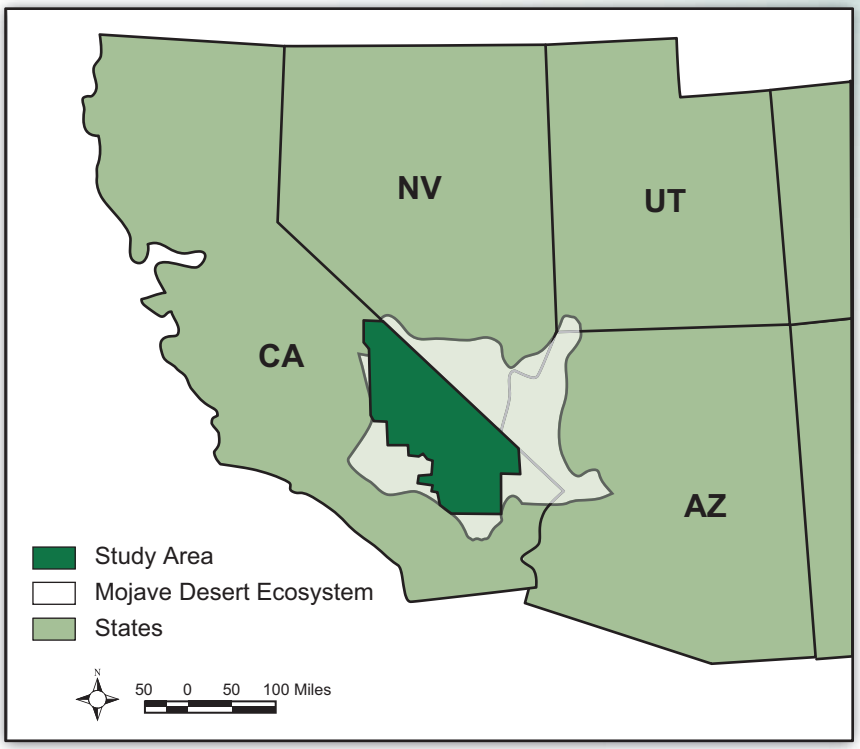
Central Mojave Vegetation Database

The Mojave Desert Ecosystem, over 25,000 square miles, encompasses parts of Nevada, Arizona, Utah, and California. The elevation ranges from below sea level in Death Valley to over 5,000 ft. (1,600 m.). Many endangered plants and animals, such as the desert tortoise (*Gopherus agassizii*), depend on the Mojave ecosystem. The region faces population pressure due to urbanization and suburbanization from Las Vegas, the Colorado River corridor, and in the western Mojave. It supports major transportation corridors and is increasingly the location of both passive and active tourism, including extensive off-highway vehicle use. Agriculture, mining and military activities are management priorities in several areas. Public land managers are faced with the difficult task of protecting the desert ecosystem and ensuring the survival of threatened species while supporting sustainable economies, communities, and national defense preparedness. Scientific, natural, and cultural resource professionals in the Mojave have agreed upon the importance of developing protocols to guide land management decisions. Scientists of the U.S. Geological Survey are working with land managers to compile scientific information into databases, predictive models, and maps to allow them to better manage the natural resources of the Mojave Desert.



Information on vegetation characteristics (composition and cover) in the Mojave is one critical component in understanding the desert ecosystem and making management decisions that support a sustainable ecosystem. The mapping and description of vegetation provides baseline information for fire management planning and for understanding long-term changes in plant communities. It also provides a context for understanding the suitability of a habitat for wildlife such as the endangered desert tortoise. In addition, vegetation maps can be combined with other data to create predictive models. For example, information on land use, soil texture and biological soil crust cover, when considered in conjunction with vegetation cover, can be used to estimate wind erosion potential or for planning infrastructure development.

The U.S. Geological Survey (USGS) led a team that recently mapped and described vegetation in the Eastern Mojave Desert of California. The vegetation map covers over 5 million hectares, or 43% of the Mojave Ecoregion, at a minimum mapping unit of 5 hectares. Existing data were reviewed and quantitatively classified, and new data were collected from over 1,200 vegetation plots during the project. The team mapped the vegetation types using a combination of extensive field measurements,

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Central Mojave Vegetation and Land Cover

Joshua Tree Wooded Shrubland

Alliance:
Yucca brevifolia Wooded Shrubland
Location shown:
Cima Dome
Coverage:
274,280 hectares (5.5% of map area)

Pinyon Woodlands and Shrublands

Alliance:
Pinus monophylla Woodland
Location shown:
Clark Mountain
Coverage:
104,846 hectares (0.2% of map area)

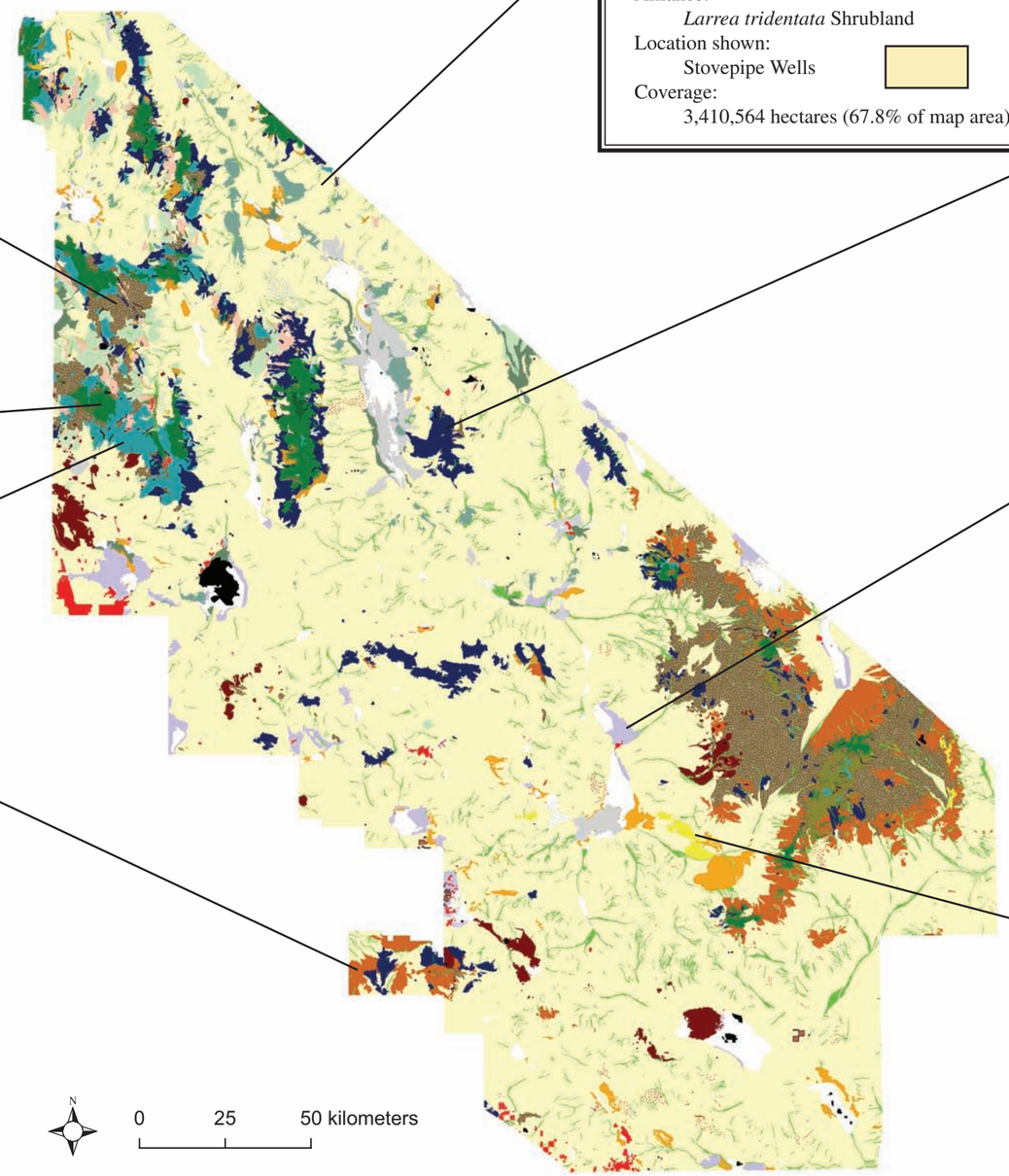
Big Sagebrush Shrubland

Alliance:
Artemisia tridentata Shrubland
Location shown:
Mid Hills
Coverage:
81,872 hectares (1.6% of map area)

Mojave Yucca Shrubland

Alliance:
Yucca schidigera Shrubland
Location shown:
Southern Nopah Range
Coverage:
156,638 hectares (3.1% of map area)

- Agricultural Land Use
- Big Sagebrush Shrubland
- Blackbrush Shrubland
- Creosote Bush Shrubland
- Creosote Bush/Brittlebush Mosaic
- Desert Holly Shrubland
- Dunes
- Galleta Grasslands
- High Elevation Pine Woodlands
- High Elevation Wash System
- Hopsage Shrubland
- Joshua Tree Wooded Shrubland
- Juniper Wooded Shrubland
- Lava Beds and Cinder Cones
- Low Elevation Wash System
- Menodora Shrubland
- Mesquite Shrubland
- Mid Elevation Wash System
- Mining
- Mojave Yucca Shrubland
- Nevada Joint-Fir Shrubland
- Iodine Bush-Seepweed Complex
- Pinyon Woodlands and Shrublands
- Playa
- Rural Development
- Saltbush Complex
- Saltgrass
- Shadscale Shrubland
- Sparsely Vegetated
- Urban
- White Burrobush Shrubland



Creosote Bush Shrubland

Alliance:
Larrea tridentata Shrubland
Location shown:
Stovepipe Wells
Coverage:
3,410,564 hectares (67.8% of map area)

Blackbrush Shrubland

Alliance:
Coleogyne ramosisima Shrubland
Location shown:
Homewood Canyon
Coverage:
177,366 hectares (3.5% of map area)

Saltbush Complex

Alliance:
Atriplex canescens Shrubland
Location shown:
Stovepipe Wells
Coverage:
67,055 hectares (1.3% of map area)

Galleta Grasslands

Alliance:
Pleuraphis rigida Herbaceous
Location shown:
East of Superior Lake
Coverage:
10,215 hectares (0.2% of map area)

aerial photography, satellite remote sensing, and statistical modeling.

The method of vegetation classification for a map has a tremendous influence on the utility of the data for land managers. Quantitative, data-driven vegetation classification creates an unbiased source of information for scientific and management applications. The scientific team used the National Vegetation Classification (NVC) structure to classify vegetation into alliances. The Federal Geographic Data Committee, a group of representatives from various federal agencies, created the NVC structure to help standardize vegetation classification. This standardized classification provides common terminology and procedure so that description, inventory and monitoring of vegetation have consistency across agency and state boundaries, making vegetation management more effective and efficient. Under this system, areas with common vegetation types are grouped into vegetation alliances.

The broader, upper levels of classification describe vegetation by their lifeform, or physiognomy (i.e. tree, shrub, grass). At the lower, more specific levels, vegetation is described by the plant species that occur. The plant species with the greatest cover generally identifies the alliance. In some cases however, the plant that is visually dominant, even if it does not have the greatest cover, is used to characterize the alliance. The NVC name for the alliance is formed by the Latin name for the dominant plant and the structure of the community type such as Forest, Woodland, Shrubland, or Herbaceous. For example, an area dominated by Joshua Trees is labeled as "*Yucca brevifolia* Wooded Shrubland".

The vegetation map compiled by the USGS depicts vegetation types at two levels. The 'Land Cover' label depicts 31 alliances, alliance groups, and land use types. The team identified 104 vegetation alliances for the entire Mojave ecoregion; 20 of which the team identified for the first time. Not all of the 104 alliances occur in the project study area; the final report describes 70 alliances found in the study area.

The products from this project are compiled in the Mojave Desert Ecosystem Program Central Mojave Database and can be used by researchers, land mangers, policy makers, and the public.

In addition, scientists from the USGS Recoverability and Vulnerability of Desert Ecosystems (RVDE) program are synthesizing this and other scientific information into spatial models that help land managers predict how the desert responds to disturbance as well as its ability to recover. Maps and models of the most relevant landscape characteristics are combined with information on ecosystem processes gained from scientific experiments and field studies. As these are refined and additional models are developed, they are being combined into a set of decision-making tools that can be used by land managers. Prototype models are being developed that examine soil compaction, wind erosion, soil crust cover, and vegetation recovery. This data can be used in conjunction with information on surficial geology, soil texture, and climate to determine the best and most sustainable uses for particular areas. For example, comparing the relative vulnerability of several sites could help in deciding the best location for off-road vehicle use. Analyzing recovery times could determine where road closures will be most effective in restoring habitat.

The Central Mojave Vegetation Database is available on the web and includes: a printable GIS coverage map, an Access database of field data for the vegetation plots, a report describing the mapping methods, a list of all alliances identified in the Mojave Ecoregion, a key to the alliances found in the mapping area, and descriptions and pictures of 70 alliances.

These data are available at the USGS Southwest Biological Science Center website at http://sbsc.wr.usgs.gov/.

Cooperating Agencies:

Department of Defense Legacy Program
https://www.denix.osd.mil/denix/Public/ES-Programs/Conservation/Legacy/dodlegacy.html

USGS Recoverability and Vulnerability of Desert Ecosystems
http://geography.wr.usgs.gov/mojave/rvde/

Desert Manager's Group
http://www.dmg.gov/

Mojave Desert Ecosystem Program
http://www.mojavedata.gov/

San Diego State University
http://www.sdsu.edu/

California Department of Fish and Game
http://www.dfg.ca.gov/

NatureServe (A network connencting science with conservation)
http://www.natureserve.org/

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