Sweeney Granite Mountains Desert Res Ctr

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Location within Domain: eastern Mojave Desert of California, in the Mojave Desert subdomain. (Lat. 34.782, Long. -115.653)

History: The Sweeney Granite Mountains Desert Research Center (GMDRC) is a 3,600 ha (9,000 ac) reserve that was established in 1978 in eastern San Bernardino County about 275 km northeast of Riverside, California, and 180 km southwest of Las Vegas, Nevada. The GMDRC is one of 35 Reserves that comprise the University of California Natural Reserve System (http//nrs.ucop.edu).

Key Characteristics: The Granite Mountains are one of the largest ranges in the east Mojave Desert, located at the southern terminus of a long chain of ranges that extends northward into the Great Basin Desert of Nevada. The range lies within a transition zone between the Colorado (Sonoran) Desert to the south, the Great Basin Desert to the north, the Colorado Plateau to the east, and the western Mojave Desert. This position, in addition to obtaining some of the higher elevations in the Mojave Desert, is reflected in the range's diverse plant and animal communities, which include many species at the margin of their geographical distributions. The congressionally designated GMDRC consists of 1,100 ha of UC-owned land and 2,500 ha of federal wilderness lands cooperatively managed with the National Park Service, Mojave National Preserve. The GMDRC lies on the eastern slopes of the Granite Mountains. Upslope, the reserve rises amid pinyon- and juniper-covered ridges to the highest peak in the Granite Mountains (2,071 m / 6,796 ft). Large watersheds descend precipitously to the north and east into the sandy alluvial valleys of Cottonwood Basin, and Granite Cove. The lower slopes are characterized by fractured granitic canyon walls and outlying boulders, with vertical faces rising up to 150 m (~ 500 ft). Near the GMDRC's eastern boundary, large boulders and exposed pediment give way to densely vegetated bajadas and washes. Springs and seeps with associated wetland plants and invertebrates are common throughout the site.

Climate at the GMDRC is characterized by low rainfall and humidity, broad temperature variation, and strong winds (especially in winter). The Center has been monitoring temperature and precipitation in Granite Cove since 1986. Mean annual precipitation in Granite Cove is 23 cm (9.0 in). Unlike the west Mojave Desert, which is relatively dry in summer, approximately 25-30% of the annual precipitation in the east Mojave Desert occurs during the summer monsoon. The principal source of winter precipitation is from Pacific frontal systems. Light winter snows are common, and a snow pack may even accumulate at elevations above 1,900 m (~ 6,000 ft). And though some of the earth's hottest temperatures are recorded in adjacent valleys, peak summer temperatures at the Center are relatively mild, with an average high of 34ºC (94ºF) and low of 22ºC (71ºF). The highest temperature recorded at Granite Cove to date is 41.6ºC (107ºF); the coldest winter temperature is - 11ºC (11ºF).

Facilities: The Allanson Center Laboratory and Library located in Granite Cove on the southeast corner of the GMDRC represents the headquarters and primary developed site at the GMDRC. Facilities include a laboratory with common lab equipment, a collections room housing the herbarium, vertebrate and invertebrate collections, a library and staff offices. The main buildings of the Allanson Center are constructed using a solar passive design for optimum energy

efficiency. Four researcher cabins and a loft house up to 15 researchers with shared kitchen facilities and commons area. The Southard Conference Room accommodates up to 40 persons for presentations and meetings. The conference room is equipped with black boards, computers with internet access and multi-media functions. All facilities are powered by solar photovoltaic electricity, and have wireless local area network with high speed DSL connectivity. Used primarily by visiting classes, the Kenneth S. Norris Cabin is located within the Norris Teaching Area at the Center's northwest corner. The Norris Cabin accommodates up to 30 persons.

Research Capabilities of the Reserve: Five primary assets contribute to the research capabilities of the GMDRC: 1) its status as a protected research area; 2) established databases and research history; 3) pristine and diverse wildlands with intact ecosystem processes; 4) close proximity to unparalleled diversity of desert landscapes and ecosystems, and 5) support services including a technical staff and available laboratory and housing facilities to complement field studies. The GMDRC is the only protected site in the Mojave Desert of California dedicated to research and teaching. There is no public access or recreational use of the GMDRC. Scientists may undertake long-term projects with confidence that their sites will not be disturbed by conflicting uses. Additional protection is conferred by encompassing state and federal administrative overlays that limit activities on adjacent lands. The GMDRC lies embedded within the 1.4 million ac Mojave National Preserve, ensuring protection, long-term viability, and access for the scientific community to this outstanding regional wildland. The GMDRC is within a 4 hour commuting distance to more than 20 major universities including the University of California campuses (UC Irvine, UC Los Angeles, UC Riverside, and UC San Diego), six California State Universities, the University of Nevada Las Vegas and Arizona State University.

Existing Infrastructure: Instrumentation: 2 GPS seismic monitoring stations (USGS and Cal Tech); 2 soil moisture/temperature stations (USGS); 3 weather stations (NRS, USGS, NPS); approximately 12 long-term transects/plots for vegetation and vertebrate monitoring. Databases: long-term data base for weather, plants and animals.

Potential Contributions to the Domain: The GMDRC is located within the heart of the most pristine and undisturbed expanse of the east Mojave Desert, capturing the outstanding quality and diversity of this region. Located at the hub of three major deserts, the GMDRC is embedded within millions of acres of protected federal lands that will not be developed. In contrast to more degraded sites, the GMDRC represents an increasingly rare example of undisturbed lands available to study natural conditions as well as invasive plant and animal response themes representative of the Mojave Desert .