

# Red Rock Poppy (*Eschscholzia minutiflora* ssp. *twisselmannii*)

## Legal Status

**State:** S2.2<sup>1</sup>

**California Rare Plant Rank:** 1B.2<sup>2</sup>

**Federal:** Bureau of Land Management Sensitive

**Critical Habitat:** N/A

**Recovery Planning:** N/A

## Taxonomy

Red Rock poppy (*Eschscholzia minutiflora* ssp. *twisselmannii*) is a small annual herb in the poppy family (Papaveraceae) (Jepson Flora Project 2011). Red Rock poppy was originally described in 1991 by C. Clark and M. Faull (Clark and Faull 1991), who distinguished it from other subspecies by the larger flowers and the ploidy level. The status of this subspecies is considered unresolved in the Jepson Interchange because further study is needed to determine whether formal taxonomic recognition is warranted. The Jepson Interchange does not currently recognize any subspecies of *E. minutiflora* (Jepson Flora Project 2011). *E. parishii* has been misapplied to the plants called *E. minutiflora* ssp. *twisselmannii*. However, this is unlikely to affect the species' legal status.

Red Rock poppy stands approximately 2 to 14 inches tall (BLM 2010). A full physical description of the subspecies can be found in the original publication (Clark and Faull 1991) and in the Jepson eFlora (Jepson Flora Project 2011).

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<sup>1</sup> **S1:** Imperiled; **X.2:** Imperiled.

<sup>2</sup> **1B:** Rare, threatened, or endangered in California and elsewhere. **X.2:** Fairly endangered in California.

## Distribution

### General

Red Rock poppy is known only from the Rand and El Paso mountains in Kern and San Bernardino counties in the western Mojave Desert (CNPS 2011; Jepson Flora Project 2011; Figure SP-P26). All 26 California Natural Diversity Database (CNDDDB) occurrences are in the Plan Area (CDFG 2012a).

### Distribution and Occurrences within the Plan Area

#### *Historical*

There are two CNDDDB occurrences in the Plan Area from before 1990 (CDFG 2012a; Figure SP-P26). One of these is a record from 1958 located approximately 2 miles southeast of Searles Station with unknown ownership (CDFG 2012a). The other is located on Edwards Air Force Base (AFB) managed by the Department of Defense; a Bureau of Land Management (BLM) report from 1999 states that this is a “probable occurrence,” but the identification needs verification (CDFG 2012a). Both of these occurrences are presumed to be extant (CDFG 2012a).

#### *Recent*

Twenty-four of the twenty-six CNDDDB occurrences in the Plan Area are recent occurrences (after 1990) and are presumed to be extant. Six of these are located within Red Rock Canyon State Park, managed by the California Department of Parks and Recreation. The remaining 18 are located on BLM land farther east (CDFG 2012a; Figure SP-P26).

## Natural History

### Habitat Requirements

Red Rock poppy occurs on volcanic tuff in Mojavean desert scrub on desert washes, flats, and slopes (CNPS 2011; CDFG 2012a). It has been recorded on bajadas and alluvial fans, flats, washes, and slopes (CDFG 2012a). The subspecies may be specific to rhyolite tuffs and granitic

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derived soils (Clark and Faull 1991), but these are common in the area where Red Rock poppy occurs (Sanders and Pitzer 2006). Red Rock poppy has also been reported on sedimentary mounds, limestone, metamorphic rocks, and rocky basalt (CDFG 2012a). Aspects are generally west, southwest, or south (CDFG 2012a). Associated species include a variety of common Mojave desert scrub shrubs and herbs (CDFG 2012a).

The subspecies ranges in elevation from 680 to 1,230 meters (2,231 to 4,035 feet) according to CNPS (2011), but one occurrence is at 4,040 feet (CDFG 2012a). Table 1 lists primary habitat associations and parameters for Red Rock poppy.

**Table 1.** Habitat Associations for Red Rock Poppy

Land Cover Type	Habitat Designation	Habitat Parameters	Supporting Information
Mojavean desert scrub	Primary	Associated with volcanic tuff, but recorded on a variety of substrates; 2,176 to 4,040 feet elevation	CNPS 2011; CDFG 2012a

**Note:** Because it has been recorded on a variety of substrates (CDFG 2012a), soil/geologic restrictions were not included in the species model.

### Reproduction

This annual herb blooms from March to May (CNPS 2011). Red Rock poppy has a relatively large colorful flower, so it is most likely probably insect pollinated. Potential pollinators of Red Rock poppy that have been recorded on Edwards AFB include solitary bees (*Dufourea desertorum*, *D. malacothricis*, *D. vernalis*), a hersperapis bee (*Hesperapis parva*), and miner bees (*Perdita carinata*, *P. inflexa*, *P. mortuaria*, *P. mucronata*, *P. robustula*) (Buchman et al. 2010).

Information on the natural history of Red Rock poppy, such as seed germination, and seed dispersal has not been reported. However, Red Rock poppy is a desert annual, so it reproduces by seed. In addition, the soil seed bank is probably important for the long-term survival of populations, as it is for many other desert annuals.

### Ecological Relationships

Red Rock poppy is associated with bajadas and alluvial fans, flats, washes, and slopes in Mojavean desert scrub communities on volcanic tuff (CNPS 2011; CDFG 2012a). This subspecies has a very limited geographic distribution, and little is known of its life history and ecological relationships. As an annual species the population numbers vary widely from year to year in response to annual rainfall. Plants may not appear at all in low rainfall years (CDFG 2012a).

### Population Status and Trends

**Global:** G5T2, Imperiled (CDFG 2012b)

**State:** S2.2, Imperiled (CDFG 2012b)

For the 22 recent occurrences in the Plan Area, population size estimates total over 41,000 plants (CDFG 2012a). The type locality for this species in Red Rock Canyon is the largest population with over 35,000 plants observed in 2003. In previous years this occurrence contained 100 plants in 1998, 8 plants in 1989–1990, and approximately 16,000 plants in 1991 during an exceptional bloom. This occurrence was last seen in 2005, but a population estimate was not recorded. The population in Mesquite Canyon is the second best for Red Rock poppy with an estimated 3,375 individuals in 1991 (CDFG 2012a). No additional data are available to determine its current status and population trend. CDFG (2012a) lists the trend as unknown for all occurrences.

### Threats and Environmental Stressors

Red Rock poppy is threatened primarily by off-highway vehicles (OHV) (CNPS 2011; CDFG 2012a). In Red Rock Canyon State Park, habitat for Red Rock poppy occurs along the main routes of travel (Sampson 2007). OHVs disrupt the surface soil and compact the surface soil and subsoil, leading to soil loss. The most significant long term effect is the accelerated erosion and associated inability of areas subject to heavy OHV use to support natural revegetation. OHV use also directly damages and destroys plants. Plant rehabilitation efforts are often marginally successful or unsuccessful (as cited in Sampson 2007).

### Conservation and Management Activities

Six of the 26 known occurrences are within Red Rock Canyon State Park (CDFG 2012a), where potential disturbance is minimal because the area is protected. Protective management and monitoring of Red Rock poppy has occurred at Red Rock Canyon State Park (BLM 1999). Eighteen of the 26 known occurrences are on BLM lands (CDFG 2012a). The BLM manages for sensitive plant species occurring on land they administer, including on lands where Red Rock poppy have been documented (BLM 2003). There are no significant threats to Red Rock poppy within the BLM-managed lands in the El Paso Mountains (BLM 2005).

The West Mojave Plan conservation strategy for Red Rock poppy consists of designating a network of open routes of travel that minimize parallel routes, hill climbs, and straying off established paths. Only two newly detected populations of Red Rock poppy found on private land would be subject to incidental take. Take would be limited to 50 acres of occupied habitat and 50% of newly detected populations would be conserved (BLM 2005).

### Data Characterization

Little is known regarding the reproductive biology or ecology of Red Rock poppy.

Red Rock poppy's distribution and the size of populations remains poorly understood (Sanders and Pitzer 2006). The CNPS "Treasure Hunt" effort, which did target the Mojave Desert, found four new occurrences of Red Rock poppy in 2010, suggesting that the suitable habitat may not be well-surveyed, or at least was not in 2010. However, these recently identified populations did not change the species' known distribution (CDFG 2012a).

There has also been some taxonomic uncertainty regarding this subspecies. Sanders and Pitzer (2006) suggested a thorough review of herbarium specimens, but presumably this had been done by Hannan and Clark for the second edition of Jepson Manual account since this subspecies is included in the Jepson eFlora (Jepson Flora Project 2011).

## Management and Monitoring Considerations

Vehicle impacts appear to be the main threat to this species (CDFG 2012a, CNPS 2011). Sampson (2007) investigated the effects of OHV use on archaeological sites in Red Rock Canyon State Park and provided recommendations on vehicular recreation management that could protect Red Rock poppy, including permitting OHV use only where the least amount of resource damage will occur and implementing an active program of biological monitoring in the park that includes a provision to study vehicle effects.

## Predicted Species Distribution in Plan Area

There are 352,817 acres of modeled suitable habitat for Red Rock poppy in the Plan Area. Modeled suitable habitat occurs in the northwestern portion of the Plan Area from 2,100 to 4,100 feet in elevation. Modeled suitable habitat includes Mojavean-Sonoran desert scrub. Appendix C includes specific model parameters and a figure showing the modeled suitable habitat in the Plan Area.

Appendix C provides a summary of the methodology used to model DRECP Covered Species with Maxent. For the Red Rock poppy, 57 occurrence points were used to train the Maxent model and 19 occurrence points were used to test the model's performance. Overall, the Maxent model has excellent statistical support. The majority of occurrence points occur in a limited geographical area, increasing the predictive power of the model. Based on a natural break in the distribution of the probability of occurrence that Maxent estimates, all 100-meter grid cells with greater than 0.186 probability of occurrence were defined as Red Rock poppy habitat.

The Maxent model predicts 186,895 acres of Red Rock poppy habitat, compared with 352,817 acres predicted by the expert model. The Maxent model predicts Red Rock poppy habitat around occurrence records, overlapping with the expert model, and to the north, where the expert model does not predict habitat. The expert model predicts more habitat south of occurrence records throughout the West Mojave.

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