

## **A.29 MOJAVE POPPY BEE (*PERDITA MECONIS*)**

Mojave poppy bee (*Perdita meconis*) is a solitary ground nesting bee in the tribe Perditini of the family Andrenidae. Mojave bees are specialist foragers; pollen gathering is restricted to poppies in the genera *Arctomecon* and *Argemone* (Griswold 1993). Adults emerge from diapause after winter rains when their host plants begin to bloom, around early April. Mating, foraging, and reproduction occur for a few weeks following emergence. Larvae develop and overwinter in diapause as prepupae, then pupate and emerge in early spring (Danforth 1999). Prepupae can enter diapause for two to three years in response to unpredictable weather conditions (Danforth 1999).

There is no confusion or dispute over the taxonomic validity of the Mojave poppy bee. Females have pale yellow head markings and are 6.5 to 7 millimeters in length, while males have dark green heads with pale yellow mandibles and are 4.5 to 5.5 millimeters in length. Females of the Mojave poppy bee are difficult to distinguish from close relatives in the *P. californica* group. Males are distinguishable by their distinctive yellow facial marks, shagreened galea, and dark metasoma with yellow markings (Griswold 1993).

### **A.29.1 Species Status**

US Fish and Wildlife Service Endangered Species Act: Under Review

US Bureau of Land Management (BLM; Nevada): Sensitive

US Forest Service (Region 4): No status

State of Nevada (NAC-527): No status

NV Natural Heritage Program: At Risk

Global Rank G2 State Rank S1

IUCN Red List (v 2020-1): No status

CITES: No status

Xerces Society for Invertebrate Conservation: None

### **A.29.2 Range**

The current known range of the Mojave poppy bee is restricted to the Lake Mead National Recreation Area and adjacent BLM lands in Clark County, Nevada (Figure A.29-1). Historically, the Mojave poppy bee also occurred in the White Hills of Arizona; the Mojave National Preserve in San Bernardino County, California; and in Washington County, Utah (Figure A.29-2). However, the Mojave poppy bee has not been documented in Arizona since 1993, nor in California since 1995 (Griswold 2018), and is believed to be extirpated from Utah (Portman et al. 2018a).

### **A.29.3 Population Trends**

There are insufficient data on the Mojave poppy bee to suggest any trends across populations. The species was described relatively recently, in 1993. Two bearpoppy species, which are host plants of the Mojave poppy bee, appear to be in decline. The Las Vegas bearpoppy (*Arctomecon californica*) was described as declining rapidly in the state of Nevada in 2001 (Nevada Natural

Heritage Program 2001). The species is considered critically endangered by the state of Nevada, with extirpation of 30 out of 91 potential populations due to rapid urban expansion (Mistretta et al. 1996). A more recent assessment, however, indicates a more stable trend on federal lands when population fluctuations due to climate variability are taken into account (TNC 2007). Populations of the dwarf bearpoppy (*Arctomecon humilis*) are also estimated to have declined by 10 to 30 percent in the short-term (NatureServe 2020).

#### **A.29.4 Distribution and Habitat Use within Clark County**

There are 32 documented occurrences of the Mojave poppy bee in Clark County from 1993, when the species was originally described, to 2005 (Griswold 2018). In 2017, the Mojave poppy bee was documented at five sites in the Lake Mead National Recreation Area: Pinto Ridge, Upper Echo Wash, Roger's Spring, St. Thomas, and Stewart's Bay/Stewart's Bay Road Junction (Portman et al. 2018b). Occurrences were also documented at Pabco Junction and a nearby site called Pabco Road on adjacent BLM lands (Portman et al. 2018b). Occurrences within Clark County are shown in Figure A.29-1.

As the Mojave poppy bee is a strict specialist, suitable habitat is restricted to dense patches of its host plants (bearpoppies) and gypsum soil with bare ground or cryptogamic crusts for nesting (Sardinas and Kremen 2014). Gypsum substrates that support host plants and Mojave poppy bee nests contain 18-69% gypsum (Megill and Walker 2006), and are often covered with low-growing lichen, moss, and cyanobacteria crusts that, when undisturbed, prevent erosion, increase moisture retention, and increase nitrogen availability in the soil (Harper and Van Buren 2004). These gypsum soils form relatively barren, low-competition sites that support a distinctive gypsum-tolerant herbaceous plant community within creosote bush, saltbush, and occasionally blackbrush scrub ecosystems (TNC 2007). All occurrences within Clark County are located in the Mojave Desert Scrub ecosystem (Heaton et al. 2011). Estimated high and medium suitability habitat for Las Vegas bearpoppy is predicted to be nearly exclusive to the Mojave Desert Scrub ecosystem (Table A.2-3). Habitat suitability for Las Vegas bearpoppy may also be a good representation of suitable habitat distribution for Mojave poppy bee; both species require soils with high gypsum contents and a well-developed cryptogamic crust (Mistretta et al. 1996), and Las Vegas bearpoppy is a host plant of the Mojave poppy bee.

#### **A.29.5 Ecosystem Level Threats**

The primary threats to the Mojave poppy bee are anthropogenic activities that threaten host plant populations and the availability of gypsum substrates with undisturbed cryptogamic crusts. Such activities include grazing, recreational off-road vehicle use, and gypsum mining (USFWS 2019). Habitat loss and fragmentation, resulting from urbanization and associated road construction, may also threaten both the Mojave poppy bee and its host plants (Center for Biological Diversity 2018).

Although domestic animal grazing is prohibited in the Lake Mead National Recreation Area, wild burro grazing (Abella 2008) and illegal cattle grazing on National Park Service land (BLM 2014, Ellis and Martinez 2014, Yachnin 2017) threaten habitat for both the Mojave poppy bee and its host plants. In addition to the direct loss of host plants, grazing decreases soil stability; increases soil compaction; and destroys intact cryptogamic crusts, thus threatening nesting habitat for the Mojave poppy bee as well (Kimoto et al. 2012, Mattoni et al. 1997). Recreational off-road vehicle use can threaten host plant populations through disturbance of the seed bank (Harper and Van Buren 2004), and through facilitation of the establishment and spread of invasive grasses (Smith et al. 2009, Brooks 2009), which displaces host plants of the Mojave poppy bee and reduces nest site availability through the elimination of bare soil.

Gypsum mining destroys both Mojave poppy bee and host plant habitat by digging up the gypsum substrate, and soil that is not dug up is compacted and disturbed by vibrations of machinery (TNC 2007). Two mines, the Lima Nevada Gypsum Mine and the Pabco Gypsum mine, are located near the Pabco Road and Pabco Junction populations, and could threaten the Mojave poppy bee via both destruction of nesting substrate and removal of host plants (BLM 2018). An approved expansion of the Lima Nevada Gypsum Mine will impact an additional 228.5 acres of gypsum habitat in the vicinity of the Pabco Road population (Johnson 2017, BLM 2018).

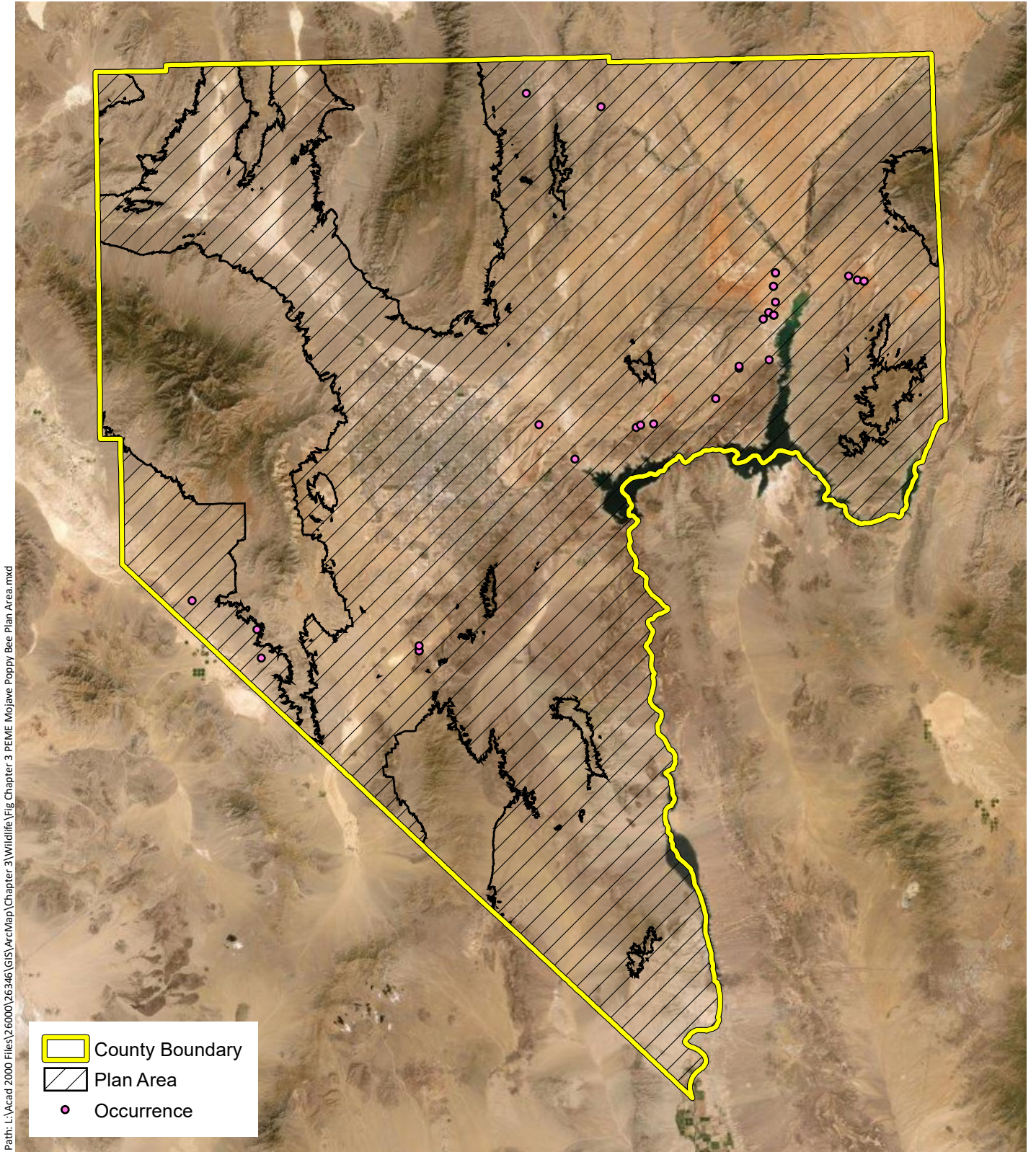
### **A.29.6 Threats to Species**

Direct threats to the Mojave poppy bee may include grazing, recreation, gypsum mining, and competition with introduced European honey bees (*Apis mellifera*) (USFWS 2019). Soil disturbance caused by grazing can disturb nesting sites, and pesticides applied to control grasshopper populations can also lead to mortality of the Mojave poppy bee (Tepedino 2000). Recreational off-road vehicle can also disturb nest sites through soil compaction and destruction of cryptogamic crusts (Sardinas and Kremen 2014). In addition to direct destruction of habitat, gypsum mining and off-road vehicles result in dust particle suspension that may desiccate bees and reduce pollen availability (Edwards & Schwartz 1981 as cited in Center for Biological Diversity 2018, Harper & Van Buren 2004).

The Mojave poppy bee is also threatened by exploitative competition with European honey bees. As managed European honey bees are not native to North America, neither the Mojave poppy bee nor its host plants have evolved to coexist with the species. No surplus pollen remains in the ecosystem, resulting in competition with the Mojave poppy bee for pollen resources (Cane and Tepedino 2017). Foraging on bearpoppies by European honey bees leads to reduced pollen availability and increased foraging time for the Mojave poppy bee, due to the Mojave poppy bee's shorter foraging distance, inability to switch host plants, and tendency to begin foraging later in the day than European honey bees (Portman et al. 2018b).

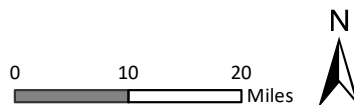
### **A.29.7 Existing Conservation Areas/Management Actions**

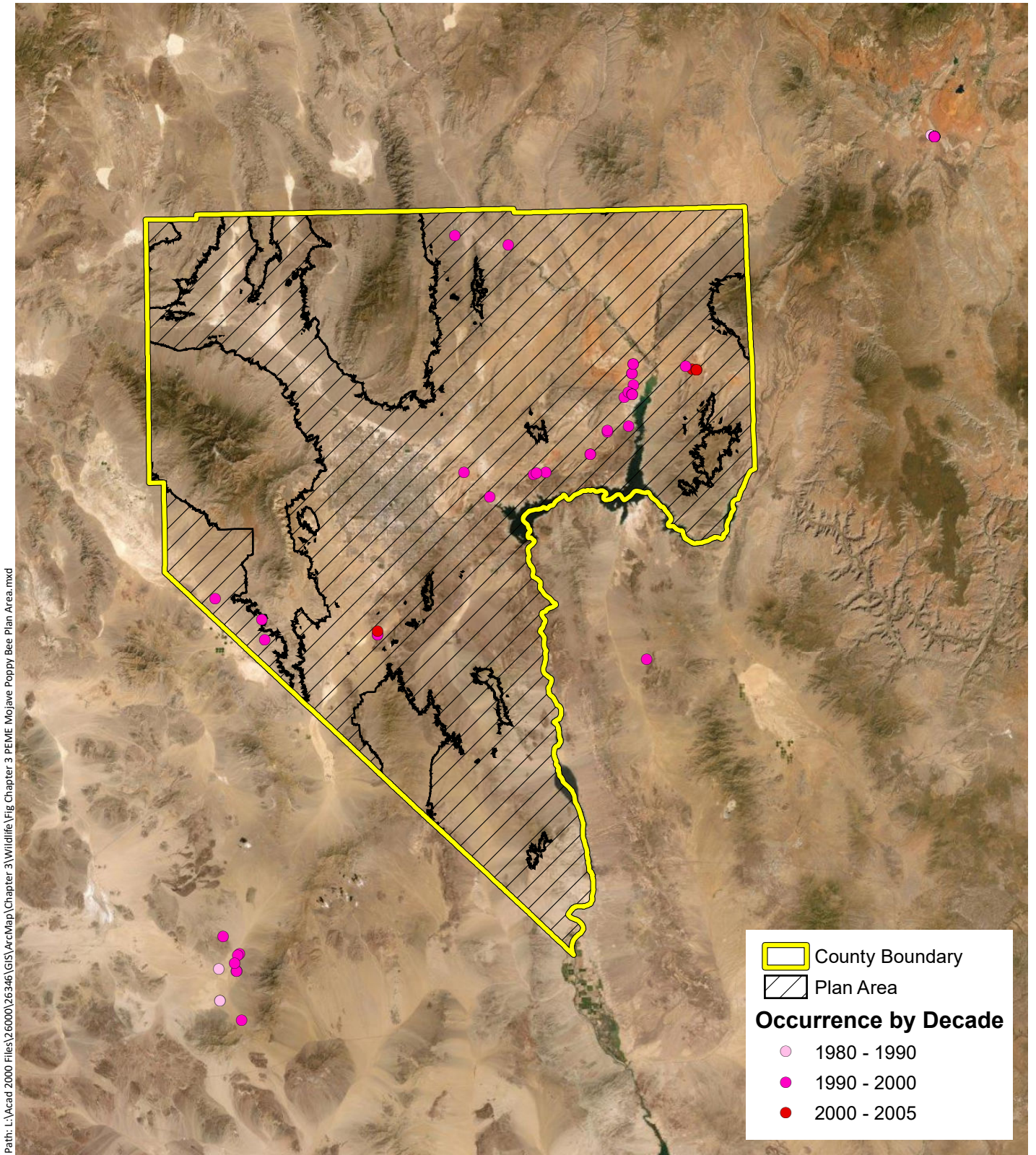
The status of the Mojave poppy bee is currently under review by the U.S. Fish and Wildlife Service (USFWS 2019). Of the seven occurrences documented in 2017, five occur in the Lake Mead National Recreation Area, managed by the National Park Service, and the remaining two occur on BLM land. Although no management strategies or plans have been developed for this species, conservation easements and management strategies (TNC 2007) prepared for one of its host plants, the Las Vegas bearpoppy, may provide indirect benefit to Mojave poppy bee.



**Figure A.29-1. Mojave Poppy Bee (*Perdita meconis*) Occurrences within Clark County and the Plan Area**

Clark County MSHCP Amendment  
Clark County, Nevada





**Figure A.29-2. Mojave Poppy Bee (*Perdita meconis*) Historic Occurrences**

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