

Bakersfield Cactus (*Opuntia basilaris* var. *treleasei*)

Legal Status

State: Endangered (1990) S1: Critically Imperiled

California Rare Plant Rank: 1B.1, Rare, threatened, or endangered in California and elsewhere. Seriously endangered in California.

Federal: Endangered (55 Federal Register [FR] 29370; July 19, 1990)

Critical Habitat: No critical habitat has been designated for this species.

Recovery Planning: *Recovery Plan for Upland Species of the San Joaquin Valley, California* (U.S. Fish and Wildlife Service 1998)

Notes: No status changes proposed or anticipated during the permit term.

Taxonomy

Bakersfield cactus (*Opuntia basilaris* var. *treleasei*) is a perennial stem succulent in the cactus family (Cactaceae). Bakersfield cactus was originally published as *Opuntia treleasei* by John Coulter (1896:434), based on specimens collected by William Trelease near Caliente. It was subsequently treated as a variety of *Opuntia basilaris* (Andrews and Toumey 1906:1,147). Griffiths and Hare (1906) described a variety of Bakersfield cactus, *O. treleasei* var. *kerni*, based on specimens from "Kern, California" with prostrate stems and a greater degree of spininess. The most recent treatments of the genus *Opuntia* maintain Bakersfield cactus as a variety of *O. basilaris* and do not recognize var. *kerni* (Pinkava 2003:144; Parfitt 2012:585).

Bakersfield cactus was listed as *Opuntia treleasei* in the Federal Register notice announcing the endangered status of the species (55 FR 29370; July 19, 1990), but the USFWS *Recovery Plan for Upland Species of the San Joaquin Valley, California* used the name *O. basilaris* var. *treleasei* (U.S. Fish and Wildlife Service 1998). This difference in nomenclature is not expected to affect the listing status of this species.

Descriptions of Bakersfield cactus' physical characteristics and discussions of how the species can be distinguished from other similar *Opuntia* species can be found in Pinkova (2003) and Parfitt (2012).

Distribution

General

Bakersfield cactus is endemic to Kern County, California. It occurs along the margins of the southern and southeastern San Joaquin Valley, primarily in the foothills near Bakersfield.

Distribution and Occurrences within the Study Area

Historical

Sixteen occurrences are known in the historical record in the study area, four of which are extirpated. The occurrences range exclusively in the northeastern portion of the study area, with roughly equal distribution on both sides of the Kern River (California Department of Fish and Game 2012).

Recent

Eight recent (post-1990) occurrences are known in the study area, all of which are presumed extant. These occurrences are generally near the central-northern border of the permit area with one located further east. Five of the occurrences are exclusively on private land, the other three are shared with private and California Department of Transportation (Caltrans), Center for Natural Lands Management, and California Department of Fish and Game (California Department of Fish and Game 2012). Currently, roughly 75% of occupied habitat is on unprotected private land, 10% on protected private land, 8% on unprotected public land, and 7% on protected public land (U.S. Fish and Wildlife Service 2011).

Natural History

Habitat Requirements

Bakersfield cactus occurs in grasslands and open, grassy area in chenopod scrub and oak woodland (California Department of Fish and Game 2012). Soils for Bakersfield cactus typically are moderately alkaline, sandy loam to sandy clay loam, with low organic material, and occasionally with gravel or cobbles¹. Individual plants have been documented to live about 50 years (U.S. Fish and Wildlife Service 2011). The most recent collection documents its association with buckwheat (*Eriogonum* sp.), rabbitbrush (*Ericameria* sp.), and sagebrush (*Artemisia tridentata*)

¹ Soils information determined by overlaying the occurrence locations over SSURGO soils maps using SoilWeb (California Soil Resources Lab 2012).

scrubs with nearby grassland and pinyon/scrub oak woodland (Consortium of California Herbaria 2012).

Table 1. Habitat Associations for Bakersfield Cactus

Land Cover Type	Habitat Designation	Habitat Parameters	Supporting Information
Chenopod scrub, grassland, cis-montane woodland	Primary	Coarse well-drained sandy or gravelly soils, from 120 to 1,830 meters (400 to 6,000 feet) elevation	Consortium of California Herbaria 2012; California Native Plant Society 2012; U.S. Fish and Wildlife Service 2011

Reproduction

Bakersfield cactus typically blooms in May but can also bloom in April (U.S. Fish and Wildlife Service 2011). This species has been shown to have a high percent of the population with triploid chromosomes. As such, primary reproduction for this species is likely not sexual as triploid individuals are sterile to some extent (Pinkava et al. 1992). This is further evidenced by the observation that seeds are produced by Bakersfield cactus infrequently. Vegetative reproduction however has been observed for this species by rooting of de-attached vegetative segments (U.S. Fish and Wildlife Service 2011).

Ecological Relationships

Conservation and management of Bakersfield cactus will depend on having adequate information on the effects of competition from nonnative grasses and grazing. Nonnative grasses appear to have an adverse effect on survival and growth of Bakersfield cactus (Cypher and Fiehler 2006). However, traditional methods for controlling nonnative grasses, such as grazing by cattle, may also have adverse effects on Bakersfield cactus as a result of trampling (Cypher et al. 2011).

A study conducted from 2002 to 2005 analyzed the effects of grass clipping and Fusilade II (a grass-specific herbicide) treatments on Bakersfield cactus survival (Cypher and Fiehler 2006). Bakersfield cactus declined on the control plots, and the rates of both vegetative and sexual reproduction were low. In contrast to the control plots, the number of cactus pads in the clipped plots and herbicide-treated plots increased (U.S. Fish and Wildlife Service 2011). This indicates that nonnative grass removal could be an effective way to increase population sizes.

Additional study is needed to determine practical and effective methods for controlling nonnative species effects on Bakersfield cactus.

Population Status and Trends

Global: G5T1: Critically Imperiled. Declining (Cypher et al. 2011)

State: S1: Critically Imperiled

Study Area: Same as above

Bakersfield cactus is represented by 38 extant occurrences, 17 of which were observed within the last 20 years (California Native Plant Society 2012). Nine to eleven occurrences have been extirpated (California Department of Fish and Game 2012; Cypher et al. 2011). Cypher et al. (2011) examined population trends for 21 occurrences and found that 10 appeared to be stable, 2 had increased, and 9 were declining.

Threats and Environmental Stressors

In general, threats to Bakersfield cactus include energy development, agriculture, grazing, mining, traffic, and urbanization (California Native Plant Society 2012; California Department of Fish and Game 2012). In a general survey in 2011, dumping was noted as a significant cause of damage to some stands of the cactus (Cypher et al. 2011). Loss of habitat is noted as the most significant source of population reduction, and within the study area residential development is the largest subset of development overall (U.S. Fish and Wildlife Service 2011). Other less well assessed threats include reduction in genetic diversity, air pollution concentration, and flooding.

Conservation and Management Activities

Most conservation efforts for Bakersfield cactus have focused on preserving existing stands, such as those within the Sand Ridge Preserve (U. S. Fish and Wildlife Service 1998). The local California Native Plant Society chapter has transplanted individuals from sites to be developed; however, the transplanted sites have not been monitored to assess viability of the transplantation (U.S. Fish and Wildlife Service 1998). Under the San Joaquin Valley Operations and Maintenance HCP, Pacific Gas and Electric Company implements avoidance and minimization measures to protect Bakersfield cactus during operations of its facilities and routine maintenance activities (Jones and Stokes 2006). Other HCPs address effects on Bakersfield cactus in the study area (U. S. Fish and Wildlife Service 2013), although these HCPs were not reviewed during preparation of this species account.

Data Characterization

Data on Bakersfield cactus is relatively current. However, while many CNDDB occurrences of Bakersfield cactus were recently surveyed, the survey report noted

that some populations could not be directly accessed, and some could not even be subjectively surveyed by binocular, leaving no data on the population status (Cypher et al. 2011). These gaps occur exclusively on private land which represents the bulk of land ownership for Bakersfield cactus making population assessments difficult to accurately quantify (U.S. Fish and Wildlife Service 2011). Additionally, new populations were discovered by the 2011 survey and subsequently added to the CNDDDB.

Management and Monitoring Considerations

Due to concerns addressed above, this species will require long-term intensive monitoring to assess population sizes and trends. The occurrences should be protected from vandalism and cattle trampling, especially those currently on private lands. Measures for controlling nonnative plants to reduce competition and improve recruitment for this species should be implemented.

Predicted Species Distribution in the Study Area

Model Description

Model Assumptions

Primary Habitat: Annual grassland, saltbush scrub, oak woodland, between 300 and 1,800 feet elevation, on the following soil series: Delano, Cuyama, Chanac, and Pleito.

Secondary Habitat: Annual grassland, saltbush scrub, oak woodland, between 300 and 1,800 feet elevation, on the following soil series: Gujarral, Klipstein, Premier, Steuber, Tunis, Whitewolf, Elkhills, Kimberlina, Kelval, Brecken, and Hesperia.

Model Rationale

Bakersfield cactus occurs in grasslands and open, grassy areas in saltbush scrub and oak woodland (California Department of Fish and Game 2012). Soils for Bakersfield cactus typically are moderately alkaline, sandy loam to sandy clay loam soils, with low organic material, and occasionally with gravel or cobbles. Most of the occurrences are in areas mapped with Delano, Cuyama, Chanac, and Pleito soils. One to three occurrences are mapped on each of the Gujarral, Klipstein, Premier, Steuber, Tunis, Whitewolf, Elkhills, Kimberlina, Kelval, Brecken, and Hesperia soils. Some of these soil series may not occur in the study area.

Model Results

Figure D-16 shows the modeled potential habitat for Bakersfield cactus within the study area. Most of the occurrences in the study area fall within the modeled habitat. Occurrences that fell outside of the predicted habitat are likely to be present in small habitat patches within map units characterized as “Developed”, which includes oil fields that are highly disturbed but have remnant habitat. The model also predicts that extensive areas along the west side of the San Joaquin Valley are potential habitat for Bakersfield cactus. However, these areas are outside of the range of Bakersfield cactus and do not provide suitable habitat for the species.

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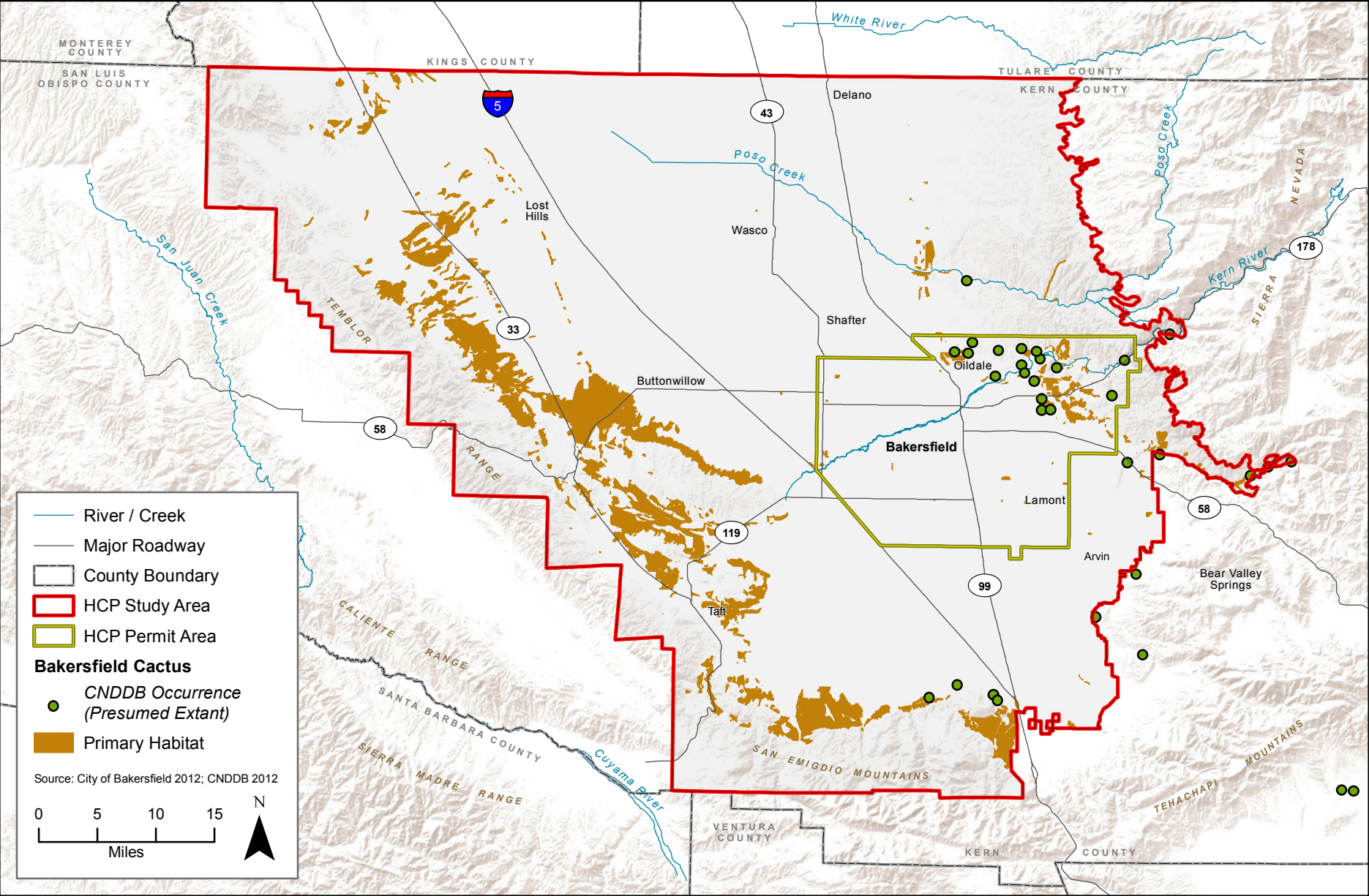
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Bakersfield Conservation Plan



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Figure D-16
Bakersfield Cactus Modeled Habitat