

5-YEAR REVIEW

Indian Knob mountainbalm (*Eriodictyon altissimum*)

March 2019

GENERAL INFORMATION

Species: Indian Knob mountainbalm (*Eriodictyon altissimum*)

Date listed: 1995

FR citation(s): 59 FR 64613–64623

Classification: endangered

BACKGROUND

Most recent status review and other relevant documents:

U.S. Fish and Wildlife Service. 2009. *Eriodictyon altissimum* (Indian Knob mountainbalm). 5-year review: summary and evaluation. Ventura, California. 16 pages.

U.S. Fish and Wildlife Service. 2013a. Endangered and threatened wildlife and plants; 12-month finding on a petition to reclassify *Eriodictyon altissimum* as threatened. *Federal Register* 78:75313–75321.

U.S. Fish and Wildlife Service. 2013b. Final species report: *Eriodictyon altissimum* (Indian Knob mountainbalm). Ventura, California. 34 pages.

FR Notice citation announcing this status review: U.S. Fish and Wildlife Service. 2018. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 50 species in California, Nevada, and the Klamath Basin of Oregon. 2018. *Federal Register* 83:28251–28254.

ASSESSMENT

Information acquired since the last status review: This 5-year review was conducted by the U.S. Fish and Wildlife Service's (USFWS) Ventura Fish and Wildlife Office, California. We solicited information for this review from interested parties through a *Federal Register* notice on June 18, 2018. Additionally, we conducted a literature search and a review of information in our files, and we contacted State agencies, local agencies, species experts, and land managers.

New information has become available since USFWS (2009; 2013a, b), in particular the following publication that is authored by biologists with USFWS, California Department of Parks and Recreation, and Santa Barbara Botanic Garden.

Kofron, C.P, C. Rutherford, L.E. Andreano, M.J. Walgren, and H. Schneider. 2019. Status of the endangered Indian Knob mountainbalm *Eriodictyon altissimum* (Namaceae) in central coastal California. *Bulletin of the Southern California Academy of Sciences* 118(1):21–41.

The information in this 5-year review is from Kofron et al. (2019) unless otherwise indicated. Primary literature citations and photos of the species can be found in Kofron et al. (2019).

Indian Knob mountainbalm (*Eriodictyon altissimum*) is endemic to western San Luis Obispo County, California (Figure 1), growing at 98–263 m/322–863 ft elevation. It is a diffusely-branched, evergreen shrub with a main stem, long narrow leaves (5–9 cm/1.0 in–3.5 in length, 2–4 mm/0.08–0.16 in width), and lavender bell-shaped flowers (11–16 mm/0.43–0.63 mm length). The species attains heights up to 5.5 m/18.0 ft tall and with a basal stem up to 20 cm/7.9 in diameter. Indian Knob mountainbalm possesses aboveground stems and underground rhizomes. Individuals just several centimeters/inches tall are capable of producing flowers. However, reproduction is reported to be primarily vegetative by underground rhizomes, and it is specialized for substrates with physical disturbances, including: steep rocky slopes, cliff faces, fallen rock debris, sand dunes (shifting sand), roadsides, old graded substrates such as dirt/rock roads, the talus of graded substrates, and trails. Indian Knob mountainbalm is considered a fire-adapted chaparral plant.

At Federal listing in 1995 (USFWS 1994, p. 64618), Indian Knob mountainbalm was known from six occurrences, two of which were in protected areas, with a total population estimate of <600 individuals. The identified threats were potential development and surface mining. In the 1998 recovery plan, USFWS (1998, p. ii, 22) recognized the following threats: habitat destruction and degradation due to potential development, invasion by non-native plant species, and alteration of fire cycles. Surface mining was no longer considered a threat. Contrary to subsequent statements, oil well drilling was not identified as a threat at listing in 1994 (USFWS 2009, p. 8; 2013a, p. 75314; 2013b, p. 9) nor in the recovery plan in 1998 (USFWS 2013a, p. 75315; 2013b, p. 11).

In the 2009 5-year review (USFWS 2009), Indian Knob mountainbalm was still known from six occurrences, of which five were in protected areas. All occurrences were considered extant, with a total population estimate of <600 individuals. Recognized threats were habitat degradation by invasive non-native plant species, in particular perennial veldt grass (*Ehrharta calycina*), stochastic events, and climate change. A recommendation was made for downlisting to threatened.

USFWS (2013a, p. 75318; 2013b, p. 23) recognized seven occurrences (five extant, two extirpated). The identified threats were potential development at Baron Canyon Ranch Estates, competition from invasive non-native plant species (in particular perennial veldt grass), small populations and limited distribution, stochastic events, lack of fire, and climate change. USFWS (2013b, p. 26) concluded that not all of the downlisting criteria in the 1998 recovery plan had been met (USFWS 2013a, p. 75320), and subsequently concluded that Indian Knob mountainbalm met the definition of endangered.

In 2019, Indian Knob mountainbalm is still known from seven occurrences, six of which are in protected areas and one (the largest) mostly in a protected area, with a total population count of 6,489+ individuals in 2016. Two occurrences are likely extirpated. The primary threat identified at listing in 1994, habitat loss as a result of potential development (specifically potential surface mining at the largest occurrence on Indian Knob mountain, and potential residential development at two small occurrences in Los Osos) has been eliminated. Based upon their field observations, Kofron et al. (2019) stated the declaration by USFWS (2013a,b) that invasive non-native grasses (particularly perennial veldt grass) pose a significant threat to Indian Knob mountainbalm is not

correct. To the contrary, no occurrence of Indian Knob mountainbalm is immediately threatened by non-native grasses. Although perennial veldt grass exists in the surrounding landscapes, Kofron et al. (2019) observed it only at occurrence 5 with just a few clumps at one location.

Identified threats in 2019 include the previously recognized threats of altered fire regime/fire suppression, small populations and limited distribution, stochastic events, and climate change. In addition, unauthorized clearing of vegetation, hikers trampling plants, unauthorized trimming of vegetation, vehicles running over plants, and road maintenance are impacting several occurrences. See Tables 1 and 2 below. Most importantly, the quality of the species' habitat is continuing to decline by vegetation becoming progressively more dense along with a lack of recent fire. The use of prescribed fire to benefit the species does not seem feasible at this time. The geographic range of the species is fragmented, the extent of occurrence for the species is small (34 km²/13 mi²), and the area of occupancy is small (<2.3 km²/0.9 mi²), which increases the risk of stochastic extinction. In consideration of the life history traits used by Anacker et al. (2013) for rare plants in California, Indian Knob mountainbalm would be considered highly vulnerable to climate change.

CONCLUSION

After reviewing the best available scientific information, we conclude that Indian Knob mountainbalm remains endangered in 2019.

RECOMMENDATIONS FOR FUTURE ACTIONS

Little is known about the biology and ecology of Indian Knob mountainbalm in 2019. Therefore, coordinated conservation and research are needed to further understand the species, and to restore and maintain the five extant occurrences.

These efforts should include:

- Management actions to benefit the occurrences.
- Searches for additional locations.
- Introduction of Indian Knob mountainbalm into living collections at botanic gardens.
- Seed collection for seed banking, with a subset of seeds used to investigate germination requirements, including cues associated with fire-following species.
- Collection and cultivation of cuttings along with seeds to develop protocols for propagation of the species.
- Studies of genetic diversity and reproductive biology, potential barriers to recruitment, and the species' relationship with fire. In particular, genetic diversity within and among the occurrences should be investigated.

Lead Field Supervisor, Fish and Wildlife Service

Approved



Date

3/22/19

REFERENCES

- Anacker B.L., M. Gogol-Prokurat, K. Leidholm, and S. Schoenig. 2013. Climate change vulnerability assessment of rare plants in California. *Madroño* 60:193–210.
- Kofron, C.P., C. Rutherford, L.E. Andreano, M.J. Walgren, and H. Schneider. 2019. Status of the endangered Indian Knob mountainbalm *Eriodictyon altissimum* (Namaceae) in central coastal California. *Bulletin of the Southern California Academy of Sciences* 118(1):21–41.
- U.S. Fish and Wildlife Service (USFWS). 1994. Endangered and threatened wildlife and plants; endangered or threatened status for five plants and the Morro shoulderband snail from western San Luis Obispo County, California. *Federal Register* 59:64613–64623.
- U.S. Fish and Wildlife Service. 1998. Recovery plan for the Morro shoulderband snail and four plants from western San Luis Obispo County, California. Portland, Oregon. 75 pages.
- U.S. Fish and Wildlife Service. 2009. *Eriodictyon altissimum* (Indian Knob mountainbalm). 5-year review: summary and evaluation. Ventura, California. 16 pages.
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Figure 1. The known geographic distribution of Indian Knob mountainbalm (*Eriodictyon altissimum*) in western San Luis Obispo County, California. Each occurrence is indicated by a black dot (extant) or black circle (likely extirpated) with the number assigned by the California Natural Diversity Database. Occurrence 8 is new.

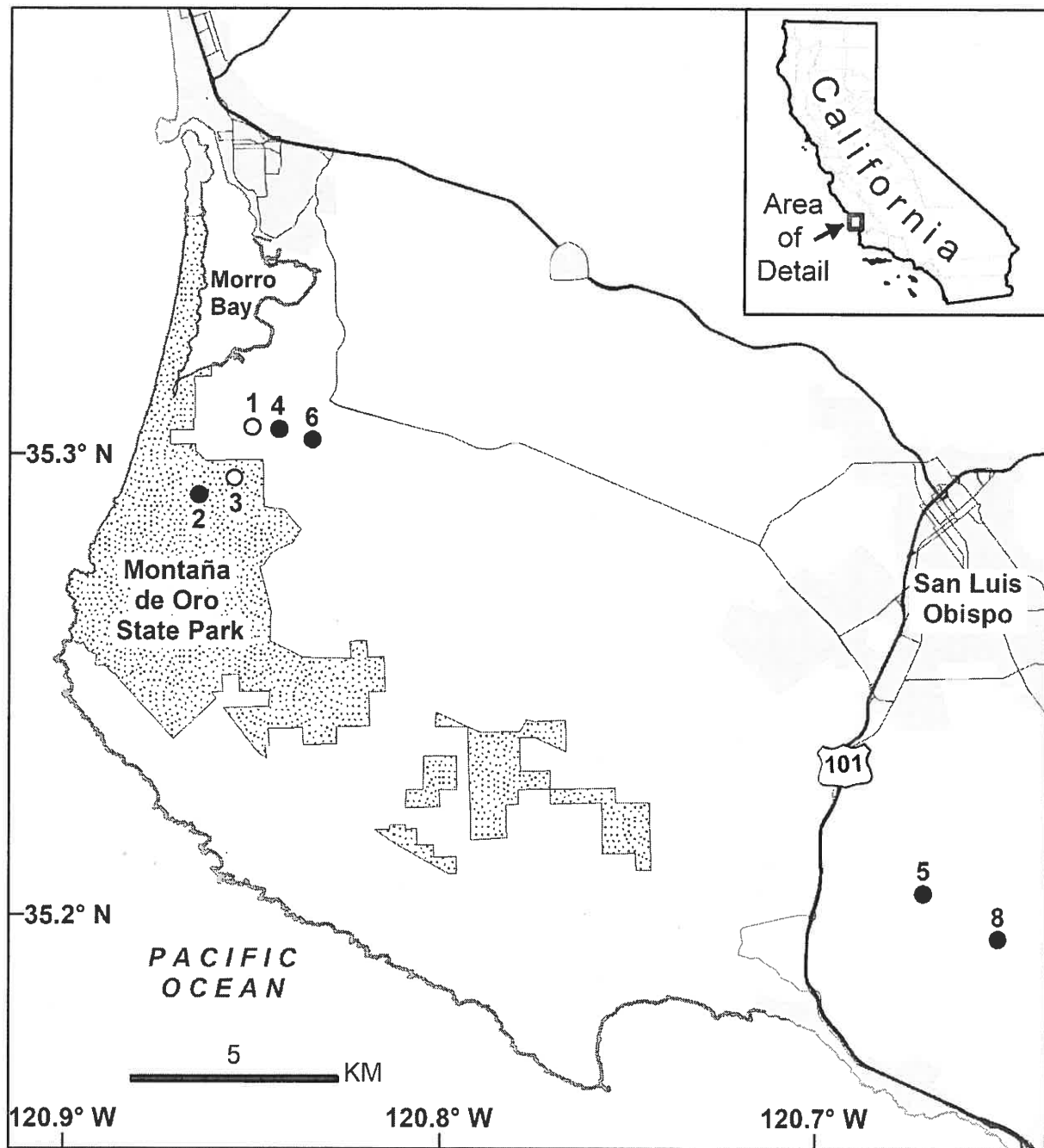


Table 1. Conservation status of the seven known occurrences of Indian Knob mountainbalm (*Eriodictyon altissimum*) in western San Luis Obispo County, California. Occurrence 8 is new. The table is from Kofron et al. (2019).

Occurrence	Location	Landowner	Protected Area	Status	Immediate threats
1	Broderson site in Los Osos	County of San Luis Obispo	Y	likely extirpated	dense vegetation altered fire regime/fire suppression
2	Montaña de Oro State Park	California Department of Parks and Recreation	Y	20 stems in 2016 in decline	low number of plants dense vegetation at one colony altered fire regime/fire suppression
3	Montaña de Oro State Park	California Department of Parks and Recreation	Y	likely extirpated	dense vegetation altered fire regime/fire suppression
4	Morro Dunes Ecological Reserve East	California Department of Fish and Wildlife	Y	23 stems in 2016 in decline	low number of plants altered fire regime/fire suppression
5	southwest Guidetti Ranch Baron Canyon Ranch Estates adjacent land south	private w/conservation easement to City of San Luis Obispo multiple private private Pacific Gas and Electric Company	Y N N	6,346+ stems in 2016	dense vegetation altered fire regime/fire suppression unauthorized clearing of vegetation
6	Morro Dunes Ecological Reserve East	California Department of Fish and Wildlife	Y	20 stems in 2016	low number of plants dense vegetation hikers trampling plants unauthorized trimming of vegetation altered fire regime/fire suppression
8	south central Guidetti Ranch	private w/conservation easement to City of San Luis Obispo	Y	80 stems in 2016	low number of plants vehicles running over plants road maintenance

Table 2. Numbers of Indian Knob mountainbalm (*Eriodictyon altissimum*) reported for the seven known occurrences in western San Luis Obispo County, California. Occurrence 7 was combined into occurrence 5 in 2018. Occurrence 8 is new. X = species observed. The table is from Kofron et al. (2019).

Year	Occurrence							
	1	2	3	4	5	6	7 before 2018	8
2018	0			X				
2017	not found		0	X		X		
2016	not found	20	not found	23	5,720+	626+		80
2015					200			X
2012	not found	X		not found	"somewhat common"			15
2011		X						
2010		X				X		10
2009	not found	37	not found	not found				11
2008	not found	28						20-25
2006	not found			not found				
2005		37					X	
1999								
1998		40						
1991					350			
1988				25				
1986				X				
1985	"might have washed away"	62-150	7	30	>100			11-50
	not found	51-100						
1982				X				
1981								
1979	"about 30"	"slightly larger than 30"	7	6	12			
1974	X	24			"grows abundantly"			
1972		"frequent in rocky places along road"		X				
1966					"locally plentiful"			
1960					"large population"			