State of California
Natural Resources Agency
Department of Fish and Wildlife

REPORT TO THE FISH AND GAME COMMISSION

EVALUATION OF A PETITION FROM CHRISTOPHER MCCARRON TO LIST LIME RIDGE ERIASTRUM (*Eriastrum ertterae*) AS ENDANGERED UNDER THE CALIFORNIA ENDANGERED SPECIES ACT

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Prepared by
California Department of Fish and Wildlife
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EXECUTIVE SUMMARY

On July 6, 2021, Christopher McCarron (Petitioner) submitted a petition (Petition) to the Fish and Game Commission (Commission) to list Lime Ridge eriastrum (*Eriastrum ertterae*) as endangered pursuant to the California Endangered Species Act (CESA), Fish and Game Code Section 2050 *et seq.* The Petition was accompanied by a letter of endorsement by the California Native Plant Society (CNPS) as a co-sponsor of the Petition.

On July 15, 2021, the Commission referred the Petition to the Department of Fish and Wildlife (Department) in accordance with Fish and Game Code Section 2073. (Cal. Reg. Notice Register 2021, No. 32-Z, p. 1022). On August 2, 2021, the Department requested a 30-day extension of the 90-day Petition evaluation period. The Commission approved the extension request at its August 18, 2021 meeting.

The Department prepared this evaluation report (Petition Evaluation) to assess the scientific information presented and cited in the Petition as well as other relevant and available scientific information possessed or received by the Department during the evaluation period.

Lime Ridge eriastrum is a low-growing herbaceous annual plant that was first discovered in 2003 and is only known from two small populations within Lime Ridge Open Space in Walnut Creek, Contra Costa County. The Petition presents information on the abundance and limited distribution of Lime Ridge eriastrum and presents information that indicates the populations are declining. The Petition also provides information indicating the long-term survival of Lime Ridge eriastrum is threatened by a number of ongoing and future threats such as (1) open space recreation; (2) utility right-of-way management; (3) fire management activities; (4) vulnerability of small populations; (5) limits on range expansion; and (6) invasive species. Information in the Petition indicates that these factors pose significant and immediate threats to Lime Ridge eriastrum.

After reviewing the Petition and other relevant information, the Department determined that the Petition contains sufficient information on population trend, range, distribution, abundance, life history, kind of habitat necessary for survival, factors affecting the ability to survive and reproduce, degree and immediacy of threat, impact of existing management efforts, suggestions for future management, and availability and sources of information, and includes a detailed distribution map.

In completing its Petition Evaluation, the Department finds there is sufficient information to indicate the petitioned action may be warranted and recommends the Commission accept and consider the Petition.

INTRODUCTION

Candidacy Evaluation

The Commission has the authority to list a native species or subspecies as threatened or endangered under CESA. (Fish & G. Code, §§ 2062, 2067, 2070.) The listing process is the same for species and subspecies. (Fish & G. Code, §§ 2070-2079.1.)

CESA sets forth a two-step process for listing a species as threatened or endangered. First, the Commission determines whether to designate a species as a candidate for listing by evaluating whether the petition provides "sufficient information to indicate that the petitioned action may be warranted." (Fish & G. Code, § 2074.2, subd. (e)(2).) If the petition is accepted for consideration, the second step requires the Department to produce, within 12 months of the Commission's acceptance of the petition, a peer reviewed report based upon the best scientific information available that advises the Commission on whether the petitioned action is warranted. (Fish & G. Code, § 2074.6.) Finally, based on that report and other information in the administrative record, the Commission determines whether the petitioned action to list the species as threatened or endangered is warranted. (Fish & G. Code, § 2075.5.)

A petition to list a species under CESA must include "information regarding the population trend, range, distribution, abundance, and life history of a species, the factors affecting the ability of the population to survive and reproduce, the degree and immediacy of the threat, the impact of existing management efforts, suggestions for future management, and the availability and sources of information. The petition shall also include information regarding the kind of habitat necessary for species survival, a detailed distribution map, and any other factors that the petitioner deems relevant." (Fish & G. Code, § 2072.3; see also Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1).) The range of a species for the Department's petition evaluation and recommendation is the species' California range only. (*Cal. Forestry Assn. v. Cal. Fish and Game Com.* (2007) 156 Cal.App.4th 1535, 1551.)

Within ten days of receipt of a petition, the Commission must refer the petition to the Department for evaluation. (Fish & G. Code, § 2073.) The Commission must also publish notice of receipt of the petition in the California Regulatory Notice Register. (Fish & G. Code, § 2073.3.) Within 90 days of receipt of the petition (or 120 days if the Commission grants an extension), the Department must evaluate the petition on its face and in relation to other relevant information the Department possesses and submit to the Commission a written evaluation report with one of the following recommendations:

- Based upon the information contained in the petition, there is not sufficient information to indicate that the petitioned action may be warranted, and the petition should be rejected; or

- Based upon the information contained in the petition, there is sufficient information to indicate that the petitioned action may be warranted, and the petition should be accepted and considered.

(Fish & G. Code, § 2073.5, subds. (a)-(b).) The Department's candidacy recommendation to the Commission is based on an evaluation of whether the petition provides sufficient scientific information relevant to the petition components set forth in Fish and Game Code Section 2072.3 and the California Code of Regulations, Title 14, Section 670.1, subdivision (d)(1).

In *Center for Biological Diversity v. California Fish and Game Commission* (2008) 166 Cal.App.4th 597, the California Court of Appeals addressed the parameters of the Commission's determination of whether a petitioned action should be accepted for consideration pursuant to Fish and Game Code Section 2074.2, subdivision (e), resulting in the species being listed as a candidate species. The court began its discussion by describing the standard for accepting a petition for consideration previously set forth in *Natural Resources Defense Council v. California Fish and Game Commission* (1994) 28 Cal.App.4th 1104:

> As we explained in *Natural Resources Defense Council*, "the term 'sufficient information' in section 2074.2 means that amount of information, when considered with the Department's written report and the comments received, that would lead a reasonable person to conclude the petitioned action may be warranted." The phrase "may be warranted" "is appropriately characterized as a 'substantial possibility that listing could occur.'" "Substantial possibility," in turn, means something more than the one-sided "reasonable possibility" test for an environmental impact report but does not require that listing be more likely than not.

(*Center for Biological Diversity*, *supra*, 166 Cal.App.4th at pp. 609-10 [internal citations omitted].) The court acknowledged that "the Commission is the finder of fact in the first instance in evaluating the information in the record." (*Id.* at p. 611.) However, the court clarified:

> [T]he standard, at this threshold in the listing process, requires only that a substantial possibility of listing could be found by an objective, reasonable person. The Commission is not free to choose between conflicting inferences on subordinate issues and thereafter rely upon those choices in assessing how a reasonable person would view the listing decision. Its decision turns not on rationally based doubt about listing, but on the absence of any substantial possibility that the species could be listed after

> the requisite review of the status of the species by the Department under [Fish and Game Code] section 2074.6.

(*Ibid*.)

Petition History

On July 6, 2021, the Petitioner submitted a Petition to the Commission to list Lime Ridge eriastrum as endangered pursuant to CESA, Fish and Game Code Section 2050 *et seq*. The Petition was accompanied by a letter of endorsement by the California Native Plant Society (CNPS) as a co-sponsor of the Petition. On July 15, 2021, the Commission referred the Petition to the Department. On August 2, 2021, the Department requested a 30-day extension of the 90-day Petition evaluation period, which the Commission approved at its August 18, 2021 meeting. The Department submitted this Petition Evaluation to the Commission for receipt at its December meeting.

The Department evaluated the scientific information presented in the Petition as well as other relevant information the Department possessed at the time of review. The Commission did not receive new information from the public during the Petition Evaluation period pursuant to Fish and Game Code Section 2073.4. Pursuant to Fish and Game Code Section 2072.3 and Section 670.1, subdivision (d)(1), of Title 14 of the California Code of Regulations, the Department evaluated whether the Petition included sufficient scientific information regarding each of the following petition components to indicate whether the petitioned action may be warranted:

- Population trend;
- Range;
- Distribution;
- Abundance;
- Life history;
- Kind of habitat necessary for survival;
- Factors affecting the ability to survive and reproduce;
- Degree and immediacy of threat;
- Impact of existing management efforts;
- Suggestions for future management;
- Availability and sources of information; and
- A detailed distribution map.

Overview of Lime Ridge Eriastrum

Lime Ridge eriastrum (*Eriastrum ertterae*) is a low-growing herbaceous plant in the phlox family (Polemoniaceae). It was first discovered by David Gowen in 2003 and was described in 2013 (Gowen 2013). Lime Ridge eriastrum is known from only two populations within Lime Ridge Open Space in Walnut Creek, Contra Costa County. One population is comprised of three colonies, and the other population consists of one colony. Lime Ridge Open Space is owned and managed by the City of Walnut Creek (City of Walnut Creek 2021).

Lime Ridge eriastrum is an annual plant, which means it completes its life cycle within one year or one growing season. Lime Ridge eriastrum typically grows between 1.5 to 20 cm (0.6 to 7.9 in) tall and has alternate leaves that are linear and entire or three-lobed at the base (De Groot 2016). The stems are often unbranched, but if branched, they are generally branched above the base (De Groot 2016). Lime Ridge eriastrum flowers in late May until mid- to late June (De Groot 2016; McCarron 2021) and produces small white flowers with a pale blue tint or blue streaks (De Groot et al. 2015). The flowers are subtended by bracts and arranged in woolly, head-like clusters (heads), with 1 to 21 or more heads that terminate the branches, but are also sometimes present in the axils below the terminal head (De Groot 2016). The woolly heads are 5 to 7 mm (0.20 to 0.28 in) long and 2 to 7 mm (0.08 to 0.28 in) wide excluding the tips of the bracts, with about 3 to 9 flowers (De Groot 2016). Lime Ridge eriastrum produces fruits called capsules, which are dry fruits derived from two or more fused ovary chambers, that are approximately 4 mm (0.16 in) long and 2 mm (0.08 in) wide. Each capsule is comprised of three fused ovary chambers, with each chamber containing two to four seeds (Gowen 2013; De Groot et al. 2015). The Petition states that no studies have examined pollinator interactions with Lime Ridge eriastrum, and no other information regarding its reproductive biology is discussed.

The Petition describes Lime Ridge eriastrum as growing on compacted, sandy soils with low nutrients and organic matter content, in a very specific habitat consisting of compacted barren calcareous (composed mostly or partly of calcium carbonate) soil in habitat transitions between chaparral and grasslands, or in open areas within shrublands. Lime Ridge eriastrum grows between about 190 to 280 m (635 to 920 ft) elevation (De Groot 2016).

SUFFICIENCY OF SCIENTIFIC INFORMATION TO INDICATE THE PETITIONED ACTION MAY BE WARRANTED

The Petition components are evaluated below, with respect to Fish and Game Code Section 2072.3 and Section 670.1, subdivision (d)(1), of Title 14 of the California Code of Regulations.

Population Trend

Scientific Information in the Petition

The Petition discusses population trend for Lime Ridge eriastrum under the “Trends” section on pages 23 and 24. The Petition indicates that regular population counts have not been conducted for Lime Ridge eriastum. The Petition notes that David Gowen observed that the population numbers appear to be decreasing and the habitat conditions have deteriorated, particularly at the northernmost population (California Natural Diversity Database [CNDDB] Element Occurrence [EO] 1), since he first described the species. The Petitioner and David Gowen also noted that in 2019 and 2020 the population numbers appeared to be lower than when the population was censused in 2018, but they did not conduct a census in 2019 or 2020 (McCarron 2021).

Conclusion

Scientific information on Lime Ridge eriastrum’s population trends is limited; however, the Petition does contain information on Lime Ridge eriastum’s population trends, and the information provided indicates that the populations are decreasing and habitat is deteriorating. The Petition contains sufficient scientific information on population trends of Lime Ridge eriastrum for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

Geographic Range

Scientific Information in the Petition

Information regarding geographic range of Lime Ridge eriastrum appears on pages 16 through 22 of the Petition under the “Distribution” section. The range of Lime Ridge eriastrum is restricted to a small area within the Lime Ridge Open Space in Walnut Creek. The Petition includes maps on pages 19 through 22 that show the range of Lime Ridge eriastrum.

Conclusion

The Petition includes information regarding the geographic range of Lime Ridge eriastrum and includes sufficient information on the geographic range of Lime Ridge eriastrum for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

Distribution

Scientific Information in the Petition

The Petition discusses distribution of Lime Ridge eriastrum on pages 16 through 22 in the "Distribution" section. There are only two known populations of Lime Ridge eriastrum, separated by less than half a mile. Both populations are growing on the southern side of Lime Ridge, south of Ygnacio Valley Road. The northernmost population (California Natural Diversity Database [CNDDB] element occurrence [EO] 1) is comprised of three small colonies (Colonies B, C, and D), and the southernmost population (EO 2) is comprised of a single colony (Colony A).

The Petition provides maps of the known populations of Lime Ridge eriastrum on pages 19 through 22, which illustrate the distribution of the species. Figure 8 from the Petition is included in this Petition Evaluation as Figure 1.

Conclusion

The Petition contains information regarding the distribution of Lime Ridge eriastrum and includes sufficient scientific information on the distribution of Lime Ridge eriastrum for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

Abundance

Scientific Information in the Petition

The Petition discusses abundance on pages 22 through 29 under the "Abundance" and "Known Occurrences" sections. The Petitioner censused both populations of Lime Ridge eriastrum in May 2018 and quantified the occupied habitat area. Census data presented in the Petition is summarized in Table 1, below. The combined area of all occupied Lime Ridge eriastrum habitat totaled 17.15 m^2 (185 ft^2). The northernmost population (EO 1) consisted of 150 plants and the southernmost population (EO 2) consisted of 1,147 plants, for a combined total of 1,297 plants.

Table 1 – Results of 2018 Population Monitoring Conducted by the Petitioner

Colony	CNDDB EO	Number of Plants	Area (m^2)
A	EO 2	1,147	10.81
B	EO 1	1	--
C	EO 1	93	2.97
D	EO 1	56	3.37
Total – both EOs		**1,297**	**17.15**

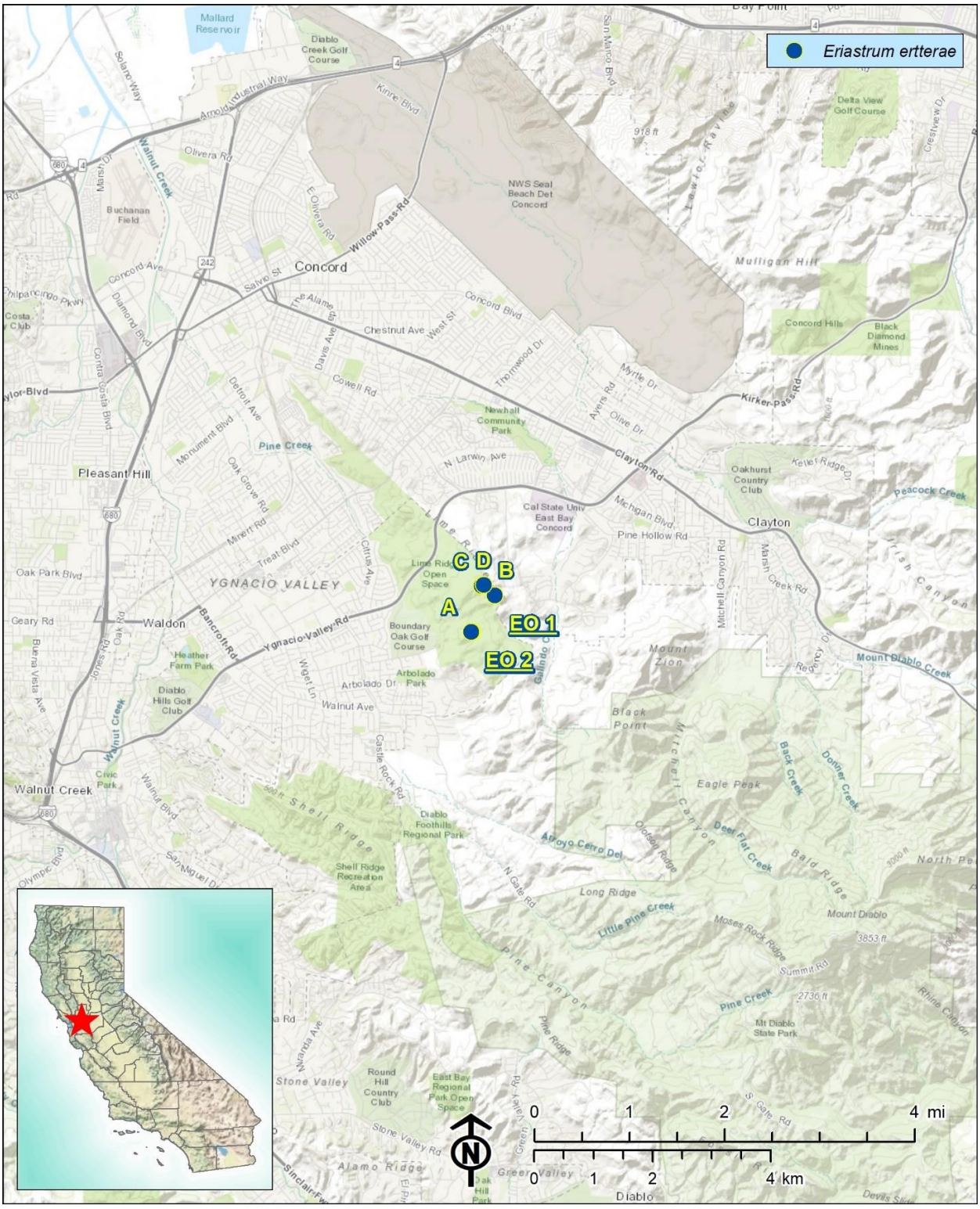

Figure 1 - Lime Ridge eriastrum populations at Lime Ridge Open Space (McCarron 2021).

Other Relevant Scientific Information

Department staff visited the Lime Ridge eriastrum populations and searched for all four colonies on June 19, 2020. Staff located Lime Ridge eriastrum at both populations, in two of the four colonies (Table 2). The timing of the visit was late in the season, and the Lime Ridge eriastrum plants were dry with little to no greenish pigmentation left. Department staff counted all identifiable Lime Ridge eriastrum plants and estimated the occupied habitat area. Table 2, below, presents the results of the 2020 population count conducted by Department staff. Based on the late timing of the site visit, the number of plants counted is likely an underestimate of the 2020 population since some plants presumably had already deteriorated. Nevertheless, the number of plants observed in 2020 was substantially less than the number counted in 2018.

Table 2 – Summary of 2020 Population Census Conducted by Department Staff

Colony	CNDDB EO	Number of Plants	Estimated Area (m^2)
A	EO 2	130	< 3
B	EO 1	0	--
C	EO 1	25	< 3
D	EO 1	0	--
Total – both EOs		**155**	< 6

Conclusion

The Petition contains information regarding the abundance of Lime Ridge eriastrum. The Petition and other scientific information available to the Department indicate that Lime Ridge eriastrum has a low abundance. The Petition contains sufficient scientific information on the abundance of Lime Ridge eriastrum for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

Life History

Scientific Information in the Petition

The Petition discusses the life history of Lime Ridge eriastrum on pages 9, 12, and 16 under the “Description,” “Phenology,” and “Reproduction Biology” sections. Lime Ridge eriastrum is an annual species, which means it completes its life cycle within one year or growing season. It flowers from late May until mid- to late June and produces fruit in late June to mid-July. The Petition indicates that no studies have been conducted to examine pollinator interactions with Lime Ridge eriastrum, but a study was conducted on another closely related species, Santa Ana River woollystar (*Eriastrum densifolium* subsp. *sanctorum*). The study found that while numerous species of native bees, bee

flies and hummingbirds pollinated Santa Ana River woollystar, seed viability was not necessarily tied to the number of pollinator visits per flower (Dorsett et al. 2001). However, the petition notes that the results may not be directly applicable to Lime Ridge eriastrum due to differences in plant size, flower structure, habitat, and geographic location.

Conclusion

The Petition contains information on the life history of Lime Ridge eriastrum, including information on life cycle and pollinator interactions. The Petition presents sufficient information on the known life history of Lime Ridge eriastrum for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

Kind of Habitat Necessary for Survival

Scientific Information in the Petition

The Petition describes Lime Ridge eriastrum habitat on pages 13 through 15. The Petition states that Lime Ridge eriastrum occurs from 190 to 280 m (620 to 920 ft) elevation (De Groot 2016) on relatively flat slopes with no clear association with slope aspect. The Petition notes that Lime Ridge eriastrum is found in a very specific habitat consisting of compacted barren calcareous (composed mostly or partly of calcium carbonate, a precursor to limestone) soil in habitat transitions between chaparral and grasslands, or in open areas within the chaparral. The Petition describes Lime Ridge eriastrum as growing on compacted, sandy soils with low nutrients and organic matter content, and notes that it is found exclusively on rock outcrops of xerortherent association as defined by the Natural Resources Conservation Service. Ortherents are described as soils within the order of entisols (soils lacking diagnostic horizons) that have formed due to erosion, and the prefix *xer* indicates a xeric (dry) climate of formation specific to Mediterranean climates (McCarron 2021).

The Petition states that Lime Ridge was mined for limestone by the Cowell Lime and Cement Company from 1908 to 1947, primarily on its northern and western slopes, and the extent of the adverse effects from mining operations on habitats and plant species is unknown. However, the Petition indicates that there is a drastic contrast between vegetation on mined versus unmined areas, and that formerly mined areas are dominated by weedy European grasses, whereas the unmined portion of the ridge is dominated by oak savanna or chaparral.

The Petition describes Lime Ridge as supporting one of the few remaining stands of chaparral left within the city limits of Walnut Creek. The Petition notes that Lime Ridge is dominated by chamise (*Adenostoma fasciculatum* var. *fasciculatum*), black sage (*Salvia*

mellifera) and Mt. Diablo manzanita (*Arctostaphylos auriculata*), making it a unique and rare subset of the *Adenostoma fasciculatum-Salvia mellifera* Shrubland Alliance as characterized by A Manual of California Vegetation (Sawyer et al. 2009). The Petition describes blue oak (*Quercus douglasii*) savanna as the other dominant vegetation type on the unmined portions of the ridge. The Petition further notes that several other rare plant species occur within these two vegetation types on Lime Ridge, including big tarplant (*Blepharizonia plumosa* [California Rare Plant Rank (CRPR) 1B.2]), Hall's bush-mallow (*Malocothamnus hallii* [CRPR 1B.2]), Lime Ridge navarretia (*Navarretia gowenii* [CRPR 1B.1]), Mt. Diablo fairy lantern (*Calochortus pulchellus* [CRPR 1B.2]), and Jepson's coyote thistle (*Eryngium jepsonii* [CRPR 1B.2]).

The Petition indicates that vegetation cover is low in the barrens where Lime Ridge eriastrum occurs, but it is often found in association with other plant species such as hollyleaf navarretia (*Navarretia atractyloides*), which is the best native plant indicator of suitable Lime Ridge eriastrum habitat. The petition also notes that other species commonly found in suitable Lime Ridge eriastrum habitat include non-native species such as tocalote (*Centaurea melitensis*), red brome (*Bromus madritensis* subsp. *rubens*), soft chess (*Bromus hordeaceus*), narrowleaf cottonrose (*Logfia gallica*), hare barley (*Hordeum murinum* subsp. *leporinum*), and nit grass (*Gastridium phleoides*).

Conclusion

The Petition contains information on the kind of habitat necessary for Lime Ridge eriastrum survival. The information presented indicates that Lime Ridge eriastrum grows in a very specific habitat type that is extremely limited within Lime Ridge Open Space. The Petition presents sufficient information regarding the kind of habitat necessary for Lime Ridge eriastrum's survival for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

Factors Affecting the Ability to Survive and Reproduce

Scientific Information in the Petition

The Petition discusses the factors affecting Lime Ridge eriastrum's ability to survive and reproduce on pages 30 through 36 under the "Threats" section. The Petition identifies the following factors as threats to Lime Ridge eriastrum: (1) open space recreation; (2) utility right-of-way management; (3) fire management activities; (4) small population size; (5) limits on range expansion; and (6) invasive species.

These factors are discussed separately below.

Open Space Recreation—The Petition describes open space recreation, mainly hiking and mountain biking, as the most imminent threat to all colonies of Lime Ridge

eriastrum. Many trails have been built in the Lime Ridge Open Space Area, and some of them allow mountain biking. However, the Petition indicates that many members of the local mountain biking community ignore the signs excluding mountain bikes from some trails, and they have built or are in the process of building illegal mountain bike trails and jumps. Some of these illegal trails are near Lime Ridge eriastrum colonies, and two of the colonies in EO 1 (colonies B and C) occur in areas with foot or mountain bike traffic. Additionally, many trails are closed off by fencing with signs noting that habitat restoration is in place; however, these signs are often ignored, and some fencing has been torn down to allow mountain bikers to pass (McCarron 2021).

The Petition indicates that plants are trampled and impacted by regular hiking and mountain bike traffic during Lime Ridge eriastrum's blooming period, likely reducing the number of individuals that produce seed. The Petition further notes that an illegal mountain bike trail is located next to Colony C in EO 1 and that if mountain bikers build jumps in this area, removal and alteration of soil could lead to extirpation of this colony.

Utility Right-of-way Management—The Petition indicates that maintenance of Pacific Gas and Electric (PG&E) infrastructure is a continuous threat to three of the four Lime Ridge eriastrum colonies (EO 1, Colonies B, C, and D), which could lead to their extirpation. The Petition notes that PG&E cleared chaparral vegetation in 2018 and piled the vegetation in an open barren where Lime Ridge eriastrum once occurred (EO 1, Colony B). The pile was still present when the Petitioner visited the colony in 2019 and 2020, reducing suitable habitat for Lime Ridge eriastrum and reducing the chance of seeds germinating from the seed bank. The Petition indicates that David Gowen historically observed hundreds of individuals at Colony B, but only one plant was found by the Petitioner at this colony in 2018. The Petition also notes that construction and use of access roads, equipment staging, pipeline excavation, and vegetation management could impact Lime Ridge eriastrum colonies. There is an underground gas line that will eventually need maintenance, which will likely involve the use of heavy equipment, soil removal, and habitat alteration, threatening the two colonies that occur on top of the gas line (EO 1, Colonies C and D), possibly leading to their extirpation (McCarron 2021).

Fire Management Activities—The Petition states that fire suppression within Lime Ridge Open Space is a priority because of nearby residential subdivisions. Lime Ridge Open Space is bisected by Ygnacio Valley Road, and the Petition indicates that vehicle sparks and cigarettes are sources of fires during the fire season. It is not known if Lime Ridge eriastrum is fire adapted. In 2018, during the Valley Fire, a fire break was constructed within 10 m (32.8 ft) of Colony D in EO 1 (McCarron 2021). The Petition notes that future fire suppression activities could threaten all colonies of Lime Ridge eriastrum from use of heavy equipment and brush clearing.

Small Population Size—The Petition indicates that the incredibly low number of individuals found during the census in 2018 suggests that genetic diversity could threaten the recovery of Lime Ridge eriastrum. Low genetic diversity can lead to a reduction in reproductive fitness and limited ability to adapt to environmental changes, further increasing the risk of extinction. The Petition also states that if the species is self-incompatible, meaning it needs outcrossing pollination to reproduction, the population size may not be large enough to maintain genetic integrity (i.e., avoid inbreeding depression) that is essential for the survival of the species.

Invasive species—The Petition indicates that invasive species threaten Lime Ridge eriastrum and describes the presence of several invasive species in and around Lime Ridge eriastrum populations. One invasive species, tocalote, is found within all colonies of EO1 and is often the sub-dominant species. The Petition notes that tocalote germinates at the same time as Lime Ridge eriastrum and continues growing while Lime Ridge eriastrum flowers and sets seed, thus competing with Lime Ridge eriastrum. The Petition also indicates that tocalote is creating monotypic stands within habitat transitions that would otherwise be barren near the northern side of Lime Ridge. The Petition states that once the invasive soft chess, nit grass, and hare barley begin to dominate around the margins of the barrens where Lime Ridge eriastrum occurs, Lime Ridge eriastrum is outcompeted. The Petition notes that non-native species not only compete with Lime Ridge eriastrum, but they increase plant biomass within the barren habitat and will likely alter soil structure, water availability, and the movement of fire through the habitat transitions. The Petition states that these invasive species will eventually outcompete existing Lime Ridge eriastrum colonies.

Inability to Expand its Range—The Petition states that viable habitat is extremely limited within Lime Ridge Open Space. The Petition notes that much of the calcareous substrate has been mined, and intact areas along Lime Ridge are rare. In addition, the areas with suitable habitat are not well-connected, and the four known colonies are disjunct. The Petition indicates that seed of Lime Ridge eriastrum is dispersed by scattering when the seed pods open and the plant has died, limiting the distance seed of this species can travel. In addition, the Petition states that the further encroachment of invasive species into suitable Lime Ridge eriastrum habitat will decrease Lime Ridge eriastrum's ability to expand its range.

Conclusion

The Petition contains information on the factors affecting the ability of Lime Ridge eriastrum to survive and reproduce. The Petition states that open space recreation, specifically mountain biking and hiking, presents the greatest threat to Lime Ridge eriastrum's continued existence. The Petition also indicates that utility right-of-way management, fire management activities, vulnerability of small populations, inability to

expand its range, and invasive species affect the ability of Lime Ridge eriastrum to survive and reproduce. The Petition contains sufficient information on the factors affecting the ability of Lime Ridge eriastrum to survive and reproduce for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

Degree and Immediacy of Threat

Scientific Information in the Petition

The Petition describes the degree and immediacy of threats to Lime Ridge eriastrum on pages 30 through 36 in the "Threats" section. The Petition indicates that recreation activities, particularly mountain biking and hiking, pose the most imminent threats to Lime Ridge eriastrum. The Petition also states that utility right-of-way management is a serious and immediate threat to Lime Ridge eriastrum, and states that maintenance activities by the utility company have already impacted the species when vegetation was piled on an existing Lime Ridge eriastrum colony in 2018. In addition, the Petition indicates fire management activities, vulnerability of small populations, limits to range expansion, and invasive species all pose significant and immediate threats to Lime Ridge eriastrum.

Conclusion

The Petition contains information on the degree and immediacy of threats to Lime Ridge eriastrum. The Petition contains sufficient information on the degree and immediacy of threats to Lime Ridge eriastrum for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

Impact of Existing Management Efforts

Scientific Information in the Petition

The Petition discusses existing management efforts on pages 36 and 37 under "Current Management Activities." The Petition indicates that interim management guidelines for Lime Ridge Open Space were drafted by East Bay CNPS Rare Plant Committee Chair, Heath Bartosh, in 2008 to avoid negative impacts to Lime Ridge eriastrum (CNPS 2008). The guidelines state that management will initially consist of "Do No Harm" until more information regarding routine maintenance activities is received from the City of Walnut Creek and population data is collected during the 2008 blooming period for Lime Ridge eriastrum. The guidelines recommend prohibiting off-road parking and vehicle use, off-trail use, trail and road grading, pest and vegetation control (e.g., herbicide application), and construction of any new facilities (e.g., roads, trails, or other structures). The guidelines also recommended the removal of a bench seat located near a fenced enclosure at the top of the ridge to reduce foot traffic in the immediate area

and the potential invasion of noxious weeds (CNPS 2008). The Petition notes that during surveys in 2018, the Petitioner observed that conditions had degraded since the guidelines were drafted in 2008, and it is unknown how closely the management guidelines were followed.

Conclusion

The Petition contains information on the impact of existing management efforts on Lime Ridge eriastrum and provides information indicating that existing management activities are not adequately protecting Lime Ridge eriastrum. The Petition contains sufficient information in the impacts of existing management efforts for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

Suggestions for Future Management

Scientific Information in the Petition

The Petition suggests future management actions on pages 37 and 38 under the "Potential Management Actions" section. The Petition recommends limiting visitor impacts during the growing season to help increase the population numbers along trails. The Petition also recommends consideration of actions to reduce the pressure from invasive species and conducting soil tests to help identify and select sites for introduction to support the establishment of additional populations of Lime Ridge eriastrum. The Petition recommends the following specific actions:

- Develop a memorandum of understanding (MOU) that details activities PG&E should be conducting when performing maintenance on the transmission towers and gas lines. The MOU should also include details about what should be done if a fire break needs to be constructed along the ridge.
- Complete utility maintenance work outside of Lime Ridge eriastrum's growing season. Cleared brush should be disposed of away from the Lime Ridge eriastrum populations.
- Exclude mountain bikes and access to specific areas in Lime Ridge Open Space. Develop a community engagement and education plan to inform people about why this is essential.
- Close off the trails around the transmission tower during blooming and seed set of Lime Ridge eriastrum to help boost population numbers.
- Develop a plan to control tocalote on the northern end of the ridge. Selective trimming and weed pulling around the marginal habitat transitions for a period of a few years could help to reduce the seed bank.
- Annually monitor tocalote invasions in Lime Ridge eriastrum populations.

- Work to educate the public about reasons for trail closures and the detrimental effects of specific land uses (e.g., creating new trails, moving soil to create bike jumps, impact during wet periods versus dry, etc.) on population viability of Lime Ridge eriastrum.

Conclusion

The Petition provides suggestions for future management of Lime Ridge eriastrum, and those suggestions may aid in conserving Lime Ridge eriastrum. The Petition provides sufficient management suggestions for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

Detailed Distribution Map

Scientific Information in the Petition

The distribution of Lime Ridge eriastrum is depicted on Figures 8 through 11 on pages 19 to 22 of the Petition. Figure 8 from the Petition is included as Figure 1 on page 8 of this Petition Evaluation Report.

Other Relevant Scientific Information

The distribution of occurrences shown on Figures 8 through 11 of the Petition closely matches the locations of occurrences of Lime Ridge eriastrum in the CNDDB (CNDDB 2021).

Conclusion

The Petition provides detailed Lime Ridge eriastrum distribution maps that are sufficient for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

Sources and Availability of Information

Scientific Information in the Petition

The “Literature Cited” section of the Petition is on pages 40 through 42. Information sources cited in the Petition include published literature and other sources. The Petitioner provided electronic copies of four of these documents to the Commission.

Other Relevant Scientific Information

The Department used additional sources of scientific information cited in this Petition Evaluation document.

Conclusion

The Petition provides sources and availability of information. The information on the availability and sources of information used in the Petition is sufficient for the Department to make the recommendation in the Recommendation to the Commission Section of this Petition Evaluation.

RECOMMENDATION TO THE COMMISSION

Pursuant to Section 2073.5 of the Fish and Game Code, the Department has evaluated the Petition on its face and in relation to other relevant information the Department possesses or received. In completing its Petition Evaluation, the Department has determined the Petition provides sufficient scientific information to indicate that the petitioned action may be warranted for Lime Ridge eriastrum. Therefore, the Department recommends the Commission accept the Petition for further consideration under CESA.

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