Notice of Petition

For action pursuant to Section 670.1, Title 14, California Code of Regulations and Division 3, Chapter 1.5, Article 2 of the California Fish and Game Code (Sections 2070 et seq.) relating to listing and delisting endangered and threatened species of plants and animals.

I. SPECIES BEING PETITIONED

Rincon Ridge ceanothus (*Ceanothus confusus*)

II. RECOMMENDED ACTION

Listing as threatened

This petition is to list the Rincon Ridge ceanothus (*Ceanothus confusus*) as threatened pursuant to the California Endangered Species Act (California Fish and Game Code Sections 2050 et seq.: CESA). This petition demonstrates that the Rincon Ridge ceanothus is eligible for and warrants listing under CESA based on the factors specified in the statute and its implementing regulations. A "threatened species" is one "that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts … ." (California Fish and Game Code Section 2067).]

The attached information supporting this petition provides sufficient information to demonstrate that the listing of Rincon Ridge ceanothus as a threatened species under CESA may be warranted; i.e., the amount of information presented would lead a reasonable person to conclude that there is a substantial possibility that listing could occur.

I respectfully request that the Department of Fish and Wildlife and the Fish and Game Commission make such recommendations and findings pursuant to their respective authorities (California Fish and Game Code Sections 2073.5 and 2074.2).

III. AUTHOR OF PETITION

John C. Hunter, Ph.D.

I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.

Signature: Date: August 29, 2025

Supporting Information for Rincon Ridge Ceanothus (*Ceanothus confusus*) Petition to the California Fish and Game Commission

Prepared by John C. Hunter, Ph.D.

August 29, 2025

Executive Summary

This document provides the scientific information required by California Fish and Game Code Section 2072.3 to demonstrate that adding Rincon Ridge ceanothus (*Ceanothus confusus*) to the list of threatened species under the California Endangered Species Act (CESA) may be warranted.

Population Trend. Rincon Ridge ceanothus is believed to have declined substantially and to have a downward trend because of loss and degradation of occupied habitat.

Range. The range of Rincon Ridge ceanothus encompasses approximately 3,180 square kilometers (1,228 square miles) at 75–1,065 meters (245–3,495 feet) in elevation in Lake, Mendocino, Napa, and Sonoma counties.

Distribution. Rincon Ridge ceanothus has 33 documented occurrences (occupied sites) in the California Natural Diversity Database (CNDDB), and two of these occurrences are likely extirpated.

Abundance. For 10 occurrences, counts of plants have been recorded and range from 30 to more than 1,500 plants, with six occurrences having 30–100 plants and four having more than 1,000 plants. The area of occupied habitat can also be a useful indicator of abundance and it is estimated to be less than 747 hectares (1,845 acres).[1]

Life History. Rincon Ridge ceanothus is an evergreen shrub in the Rhamnaceae (the buckthorn family). It is killed by fire and its seed germinate after exposure to fire.

Kind of Habitat Necessary for Survival. Rincon Ridge ceanothus grows in chaparral and woodlands, often on substrates derived from serpentinite or volcanic rock.

Factors Affecting the Ability to Survive and Reproduce. Eight different threats to specific occupied sites have been recorded in the CNDDB, and several additional threats have been identified. The primary threats are from agricultural and developed land uses, disruptions to post-fire recovery, vegetation management to reduce fire risks, and climate change.

Degree and Immediacy of Threat. Without protective measures, there is a moderate to high likelihood that Rincon Ridge ceanothus will be extirpated from much of its range or become extinct because:

- Ongoing threats have eliminated or substantially degraded nearly a quarter of occurrences, threaten most remaining occurrences, and the severity of some threats is increasing.
- Nearly half of the species' remaining occurrences are small in area, fragmented, or contain relatively few individuals, increasing vulnerability to local extirpation from random events and human action.
- Less than 20 percent of sites that likely remain occupied by Rincon Ridge ceanothus are known to be preserved or on public land managed for multiple uses, which leaves the species highly vulnerable to extirpation at most sites.

Impact of Existing Management Efforts. To date, management of Rincon Ridge ceanothus has been very limited. It has no legal protections that mandate contributions to its recovery or full mitigation of impacts, only a small portion of its known occupied habitat has been preserved, most occurrences have not been recently surveyed, and research has not been conducted on its ecology.

Suggestions for Future Management. Suggestions for future management include listing Rincon Ridge ceanothus as threatened under CESA and conserving its remaining occurrences. Fourteen suggestions are provided for future management actions.

References and a **detailed distribution map** are also provided.

[1] Estimate is the sum of (1) the acreage of specific occurrences and (2) the number of nonspecific occurrences multiplied by the average acreage of specific occurrences. This is an overestimate and includes some areas that are now in developed or agricultural land cover; excludes occurrences that likely have been extirpated.

The scientific information in the following sections demonstrates that adding Rincon Ridge ceanothus (*Ceanothus confusus*) to the list of threatened species under the California Endangered Species Act (CESA) may be warranted.

Based on much of the same information, NatureServe, in collaboration with the California Department of Fish and Wildlife (CDFW) and the California Native Plant Society (CNPS), has concluded that Rincon Ridge ceanothus is critically imperiled. Similarly, CNPS, in collaboration with CDFW, has concluded that it is rare or endangered and seriously threatened (CNPS 2025; CDFW 2024a).

NatureServe defines "Critically Imperiled" (Global Conservation Status 1 [G1]) as being at very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors (NatureServe 2012a). NatureServe designates species as G1 based on a score calculated from variables whose values are determined in collaboration with CDFW and CNPS (NatureServe 2012b).

CNPS and CDFW define the rank of "rare or endangered" (California Rare Plant Rank [CRPR] 1B) as plant species which are rare, threatened, or endangered in California and elsewhere (CNPS 2024, CDFW 2024a). These plant species are rare throughout their range, with the majority, like Rincon Ridge ceanothus, also being endemic to California. Most of the plant species that are CRPR 1B have declined significantly over the last century. CNPS has concluded that a subset of CRPR 1B plant species (rank 1B.1) is "seriously threatened in California" (the highest level of threat) because over 80 percent of their occurrences are threatened or the species otherwise has a high degree and immediacy of threat (CNPS 2024). CNPS uses staff botanists and a committee of agency, academic, other professional, and amateur botanists to assign and periodically reevaluate these rankings in collaboration with CDFW. Please note that CDFW identifies all CRPR 1B species as taxa that may meet the requirements for CESA listing (CDFW 2024a).

To make their conclusions, CNPS and NatureServe use the best available scientific information regarding population trend, range, distribution, abundance, life history, habitat, threats, and management efforts, much of which CDFW has compiled in the California Natural Diversity Database (CNDDB) (CDFW 2024b).

To provide sufficient scientific information to support this petition, a summary of the relevant information compiled, maintained, and distributed by CDFW, CNPS, and NatureServe is provided below; this information is augmented by information from:

- Datasets developed and maintained by the, California Consortium of Herbaria (CCH), California Governor's Office of Land Use and Climate Innovation, GreenInfo Network (GIN), and U.S. Geological Survey (USGS)
- Scientific and other technical literature

Information regarding each topic required by California Fish and Game Code Section 2072.3 is provided in a separate section below in the same order as in the code.

A. Population Trend

Information available from the CNDDB (CDFW 2024b) and land cover mapping (USGS 2021) indicates that Rincon Ridge ceanothus has a decreasing population trend because of loss and degradation of occupied habitat at nine or more of the 33 sites where the species has been observed (occurrences or occupied sites). [2,3]

CNDDB records that indicate a decrease include:

- One occurrence where the species is extirpated (Occurrence 9).
- Five occurrences where a declining population trend or only fair population viability has been noted (Occurrences 1,10, 23, 24, and 28).[4]

Land cover mapping that indicates a decrease includes:

- One occurrence that is likely extirpated (Occurrence 2)—this is an historical (≥ 50 years since last surveyed) occurrence with 95 percent of its mapped area in agricultural or developed land uses.
- Six occurrences with degradation or loss of habitat (Occurrences 1, 10, 17, 21, 23, and 28)—these are precisely mapped (specific) occurrences presumed extant in the CNDDB that have a portion of their mapped area in agricultural or developed land cover. The portion in agricultural or developed land cover ranges from less than one percent to 95 percent, i.e., from negligible to near total direct loss of habitat. (In the CNDDB, only fair population viability is noted for four of these sites).

In addition, degradation and loss of habitat at other sites may also contribute to the decreasing population trend. At these sites, degradation and loss of occupied habitat that is not documented in the CNDDB or by land cover mapping may be resulting from site-specific threats, range-wide threats (e.g., climate change), and nearby agricultural and developed land uses. Such degradation or loss of habitat is particularly likely at the five nonspecific occurrences that were last surveyed 62–98 years ago (Occurrences 13, 18, 26, 27, and 34) (CDFW 2024b).

Furthermore, extensive, range-wide historical and ongoing human-caused changes to chaparral and woodlands (which provide habitat for Rincon Ridge Ceanothus) suggest that Rincon Ridge ceanothus has had additional, undocumented habitat losses, population reductions, or both. These human-caused changes not only include conversion of natural lands to agricultural and developed land and disturbance by a dramatically increased human population, but also the

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[2] An occurrence (also referred to as an element occurrence) is a specific location where a plant included in the CNDDB (a plant element) has been known to occur, and that has practical conservation value. In general, any location with an observation of the plant will be turned into an occurrence since the location a plant is found is also where reproduction and important life history events take place (CDFW 2020).

[3] USGS land cover mapping is more recent than most information in the CNDDB and is described further in Section G, “Factors Affecting the Ability to Survive and Reproduce (Threats).”

[4] Viability is as noted in the CNDDB’s “Occurrence Rank” field (i.e., overall condition or viability). The occurrence rank fields are Unknown, Poor, Fair, Good, or Excellent, and are based on observed quality of habitat and condition of the population at that location.

introduction of livestock and invasive plant species, and the alteration of fire regimes (Burcham 1957, Seabloom et al. 2006, Minnich 2008, Stephens and Sugihara 2006). Most of these changes occurred before the distribution of Rincon Ridge ceanothus was well documented and thus their impacts are undocumented.

B. Range

Rincon Ridge ceanothus is a California endemic with a limited range in the southern North Coast Ranges (Burge and Wilken 2020a). Its range is mostly limited to the Mayacamas Mountains and comprises approximately 3,180 square kilometers (1,228 square miles) in Lake, Mendocino, Napa, and Sonoma counties at 75–1,065 meters (m) (245–3,495 feet [ft]) in elevation (CDFW 2024b, CNPS 2025).[5]

As calculated, this range is comparable to the "extent of occurrence" (EOO) that is used by the International Union for the Conservation of Nature (IUCN) as an indicator of extinction risk (IUCN 2024, Bachman et al. 2011).[6] The rationale for using EOO as an indicator of extinction risk is that many human-caused threats and natural events are more likely to cause similar effects at sites that are closer together than those further apart.

C. Distribution

Rincon Ridge ceanothus is known from 33 sites that were documented between 1927 and 2008 (CDFW 2024b), including two sites from which it has likely been extirpated. Of these sites, 16 (48 percent) are "nonspecific" occurrences, whose location and boundaries are not precisely known.

Because Rincon Ridge ceanothus is a shrub (a conspicuous plant) with a small–moderate-sized range containing limited potential habitat, it likely occupies few undocumented sites. Any undocumented sites would be exposed to similar threats as documented sites because most chaparral and woodlands that may provide habitat for Rincon Ridge ceanothus are exposed to similar threats. Also, like most documented occurrences, undocumented occurrences would likely be unprotected, because the much of the potential habitat for Rincon Ridge ceanothus is unprotected and botanical surveys have been more extensive on protected than unprotected lands.

The species' distribution is mapped in Section L, "Detailed Distribution Map."

[5] The extent of the species' range was calculated as the minimum convex polygon encompassing all occurrences documented in the CNDDB, including extirpated occurrences and occurrences with nonspecific locations.
[6] The IUCN consists of approximately 1,400 governmental and non-governmental organizations from more than 170 countries.

D. Abundance

Rincon Ridge ceanothus can be represented by relatively few or large numbers of plants at occupied sites. Counts of plants have been recorded for 10 of the 32 occurrences in the CNDDB (CDFW 2024b). These counts range from 30 to more than 1,500 plants, with six occurrences having 30–100 plants (Occurrences 6, 12, 19, 20, 28, and 33), a group of three occurrences with a combined count of more than 1,000 plants (Occurrences 10, 23, and 24), and one with a count of more than 1,500 plants (Occurrence 1).

Because range-wide monitoring of Rincon Ridge ceanothus has not been conducted, a rigorous estimate of the total number of plants cannot be made. In general, however, the size of populations of prostrate shrubs like Rincon Ridge ceanothus can be difficult to estimate because of challenges in distinguishing one individual from another and the vast size differences among individuals.

In contrast, the area of occupied habitat is less problematic to estimate and is a useful indicator of abundance. The mapped area of CNDDB occurrences represents the maximum extent of occupied habitat because (1) it encompasses all occupied habitat that has been documented, and (2) only a portion of it is occupied.[7] For Rincon Ridge ceanothus, "specific" occurrences (which have precisely mapped locations) have a median size of 2 hectares (5 acres) with a range of 1–144 hectares (3–355 acres) (CDFW 2024b).[8] The three largest specific occurrences (Occurrences 1, 10, and 17) account for 76 percent of the mapped area of specific occurrences. Assuming that "nonspecific occurrences" (which have only imprecisely mapped locations) are comparable in size to the average of specific occurrences, the total extent of habitat occupied by Rinon Ridge ceanothus would be less than 747 hectares (1,845 acres).[9] (If the median area of specific occurrences were used to estimate the area of nonspecific occurrences, the estimated area of occupied habitat would be only 417 hectares [1,029 acres].)

As calculated, area of occupied habitat is similar to "area of occupancy" (AOO) that is used by the IUCN as an indicator of extinction risk (IUCN 2024).[10] The rationale for using AOO as an indicator of extinction risk is that species occupying more or larger areas are less likely to have all occupied

[7] There are both ecological and methodological reasons why the species does not occupy the entire mapped area of an occurrence. Species only occupy areas to which their seed disperse and that are suitable for germination, growth, and survival, and for rare species such areas may account for only a small portion of an "occupied" site. Also, in the CNDDB, even specific occurrences include areas that are unsuitable as habitat. For example, many specific occurrences are point locations buffered by 80 m (262 ft), and the resulting 2-hectare (5-acre) area is usually much larger than the area occupied by the species. Furthermore, occupied sites documented in the CNDDB often have not been visited by a botanist for more than 10 or 20 years (or even longer), and during that time interval, habitat loss may have occurred.

[8] Occurrences 2, 12, 30, 32, 33, and 36−38 are approximately 2 hectares (5 acres) in size or smaller. Occurrence 2 has likely been extirpated.

[9] Specifically, the combined area was estimated for occurrences not likely to be extirpated using the mapped area of specific occurrences and assuming that the area of each nonspecific occurrence was equal to the average area of specific occurrences (extant and extirpated).

[10] IUCN guidelines are to calculate AOO using presence in cells of a grid of 4 kilometer^2 (1.5 mile^2) cells, which is a coarser scale than used here (IUCN 2024).

areas affected by a specific threat than a species occupying fewer, smaller areas. Also, there is a generally positive relationship between AOO and population size.

E. Life History

This section provides the species' nomenclature, a description of its morphology, and a summary of available relevant information on its reproduction and growth.

Nomenclature and Taxonomy

The Jepson eFlora currently recognizes *Ceanothus confusus* J.T. Howell as the scientific name of Rincon Ridge ceanothus and *Ceanothus divergens* Parry subsp. *confusus* (J.T. Howell) Abrams as a synonym for it (Jepson Flora Project 2024).

Species Description

Rincon Ridge ceanothus is in the Rhamnaceae (the buckthorn family). Below is a description of its morphology based on its treatment in the Jepson eFlora (Burge and Wilken 2020a).

- Habit— Rincon Ridge ceanothus is a small, mound-like shrub, growing to a height of 0.2 to 0.5 m (0.7–1.6 ft).
- Stem—the stems are spreading to somewhat ascending, and they occasionally root at the nodes. The younger portions of stems are generally red brown.
- Leaf—the leaves are simple, opposite, and evergreen. They are supported by very short petioles (< 0.2 centimeters [cm] [0.01 inches]) and are 1–2 cm (0.4–0.8 inches) in length and 0.5 to 1.4 cm (0.2–0.6 inches) in width. The leaves are elliptic to narrowly obovate in shape. The leaf blade is often slightly wavy and folded lengthwise, with the upper surface (adaxial) shiny green and glabrous, while the lower surface (abaxial) is paler and nearly glabrous, except for short, stiff hairs along the veins. The leaf margins are thickened and toothed, with three to nine sharp teeth in the distal two-thirds of the blade.
- Inflorescence—the inflorescence is umbel-like and relatively small, measuring 1–2 cm (0.4–0.8 inches) across.
- Flower—the flowers are radially symmetrical and showy, ranging in color from blue to purple. They are supported by a hypanthium (floral cup) that surrounds a fleshy disk located below the base of the ovary. Each flower has five lance-deltate sepals that are incurved and colored similarly to the petals and remain persistent after flowering. The petals are also five in number and are hood-like in shape. The stamens, which are five and positioned opposite the petals, surround a half-inferior ovary that is 3-lobed, with each lobe containing a single ovule. The ovary is topped by three styles.
- Fruit—the fruit is a nearly spherical capsule, 0.4–0.6 cm (0.16–0.24 inches) wide, and smooth to somewhat three-ridged at the distal end. Each capsule is topped by slender horns, 0.15 to 0.25 cm (0.06–0.10 inches) long.

- Seed—the seeds are three in number per capsule, and each seed measures 0.2–0.5 cm (0.08–0.10 inches) in length.

Similar Species

Ceanothus prostratus var. *occidentalis* and *Ceanothus divergens* are morphologically similar to Rincon Ridge ceanothus and all three species grow in the southern North Coast Ranges (Burge and Wilken 2020b). Rincon Ridge ceanothus and *Ceanothus divergens* can be distinguished from *Ceanothus prostratus* var. *occidentalis* by their leaves that are more or less folded and wavy, and Rincon Ridge ceanothus can be distinguished from *Ceanothus divergens* by its growth form: it roots at its nodes whereas *Ceanothus divergens* does not.

Reproduction and Growth

As noted above, Rincon Ridge ceanothus is an evergreen shrub. It is insect pollinated and blooms during February–June (CNPS 2025).

Although the growth and reproduction of Rincon Ridge ceanothus has not been studied, its genus has been well studied. Most *Ceanothus* species begin producing seed between 5 and 10 years of age (Conard and Reed 2008). The drying fruits split apart, dispersing the seed a short distance (usually only 0–3 m [0–10 ft]). Seeds of *Ceanothus* species may remain dormant in the soil for multiple years. Because many seeds are eaten, attacked by fungi or other pathogens, and as they age, lose viability, the number of seeds stored in the soil does not continually increase over the years. Rather, after most shrubs have begun reproducing, additional seed crops tend to maintain a soil "seed bank" of comparable size from year to year.[11] Seed of *Ceanothus* species primarily germinate after the seed coat has been cracked by the heat of a fire (Conard and Reed 2008).

Because fire kills Rincon Ridge ceanothus, the species depends on post-fire establishment of new individuals (i.e., it is an "obligate seeder"). In addition to the number of seeds stored in the soil and the intensity of the fire, weather, herbivory and disease, and competition from other plants all affect the post-fire establishment of Rincon Ridge ceanothus.

F. Kind of Habitat Necessary for Survival

Chaparral and woodlands provide habitat for Rincon Ridge ceanothus (CNPS 2025, CCH 2024, CDFW 2024b). In these vegetation types, it often grows on substrates derived from serpentinite or volcanic rock. (It is weakly associated with serpentine substrates [Safford and Miller 2020].) Frequently, it is located at edges or in transition zones between chaparral and woodland or forest (CCH 2024, CDFW 2024b). It is associated with both widespread chaparral shrubs such as chamise (*Adenostoma fasciculatum*) and toyon (*Heteromeles arbutifolia*) and serpentine-associated species such as leather oak (*Quercus durata*).

[11] . See O'Neil and Parker 2005 for a summary of the seed bank dynamics of *Ceanothus* species.

G. Factors Affecting the Ability to Survive and Reproduce (Threats)

This section describes the factors (threats) resulting from human actions that have been, or likely will be, substantially reducing the survival and reproduction of Rincon Ridge ceanothus, primarily by degrading or eliminating occupied habitat.[12] Prominent range-wide threats include conversion of habitat to agricultural or developed uses, disruptions to post-fire recovery, vegetation management to reduce fire risks, and climate change. Each of these threats is described in a separate section below. They are not, however, the only threats affecting Rincon Ridge ceanothus. Eight different threats, based on botanist observations, are recorded in the CNDDB as affecting one or more occurrences (CDFW 2024b):

- Agriculture—elimination of habitat or other adverse impacts due to agricultural development or agriculture-related activities (three occurrences, one of which is considered extirpated in the CNDDB)
- Development—construction of houses, businesses, and other developed land uses (eight occurrences, one of which is considered extirpated in the CNDDB)
- Grazing—incompatible grazing by livestock (one occurrence)
- Logging—extensive removal of trees (one occurrence)
- Off-road vehicle (ORV) activity—damage associated with motorized vehicles going off designated roads (three occurrences)
- Recreational use (non-ORV)—damage associated with recreational activities (one occurrence)
- Road/trail construction/maintenance—construction or maintenance of roads or trails (eight occurrences)
- Wood cutting/brush clearing—selective removal of trees or bushes (e.g., brush removal to reduce fuels for wildfires) (one occurrence)

The CNDDB documents one or more of these threats at 32 percent of occurrences.[13]

When considering these data, it is important to acknowledge that the CNDDB does not fully document the threats affecting occurrences. First, threat observations have not been provided for every documented occurrence; for example, the only documentation for some sites is the label of an herbarium specimen with little or no site information. Second, threat observations are not necessarily comprehensive and are not based on a systematic assessment. Third, many CNDDB records are now decades old: less than one-third of CNDDB records for Rincon Ridge ceanothus

[12] Numerous factors affect the ability of a plant to reproduce, grow, and survive, including interactions with pollinators, dispersal agents, seed predators, diseases, herbivores, and fungal symbiotes; availability of habitats with suitable conditions and sufficient resources; and events such as fires that can cause mortality but also provide opportunities for establishment and growth. This section focuses on those factors resulting from human actions that have been, or likely will be, substantially reducing reproduction and survival.

[13] Percentage excludes Occurrences 2 and 9, which have likely been extirpated.

occurrences contain threat information from the last 20 years (CDFW 2024b, CNPS 2025).[14] Therefore, threats are likely underreported in CNDDB records and may have changed at some occurrences, particularly unprotected ones, since they were last visited.

Agricultural and Developed Land Uses

Expansion of developed land uses and to a lesser extent agricultural land uses is a major threat to Rincon Ridge ceanothus, not only because these land uses have been directly eliminating habitat, but also because they have been fragmenting and increasing threats to the remaining habitat. In fact, many types of threats listed in the CNDDB are caused primarily by nearby agricultural and developed land uses (e.g., biocides, erosion/runoff, and vandalism/dumping). Occurrences fragmented by (and those near) agricultural and developed land uses are likely being impacted through any of several mechanisms (Collinge 2009, Honnay et al. 2005, Aquilar et al. 2019, Hansen et al. 2005, Ramalho et al. 2014).

In the CNDDB, one nonspecific occurrence of Rincon Ridge ceanothus is considered extirpated (Occurrence 9) and approximately half of its mapped area is now in agricultural or developed land uses (CDFW 2024b, Table 1). However, agricultural and developed land uses have had additional impacts on Rincon Ridge ceanothus that have not been reported in the CNDDB. First, extensive conversion of natural vegetation to agricultural and developed uses occurred before extensive documentation of the distribution of Rincon Ridge ceanothus, and thus the impacts of that land cover conversion are undocumented. Second, land cover mapping that is more recent than CNDDB mapping documents agricultural or developed land uses within the boundaries of seven specific occurrences of Rincon Ridge ceanothus that in the CNDDB are presumed to be extant (Table 1) (CDFW 2024b, USGS 2021). For two of these occurrences, agricultural and developed land uses account for more than 90 percent of their mapped area, and at least one of these (Occurrence 2) is likely extirpated. Furthermore, agricultural and developed land uses are within 100 m (328 ft) of another five occurrences and likely are impacting these populations through any of several mechanisms.

In sum, agriculture and development have likely been causing loss and degradation of habitat at 71 percent of specific occurrences of Rincon Ridge ceanothus and threaten to do so at additional occurrences (Table 1). At nonspecific (imprecisely located) occurrences, the impacts of agriculture and development on occupied habitat are uncertain but agriculture and development could be impacting multiple sites.

These impacts are likely to increase in the foreseeable future because nearly a quarter of unprotected occurrences of Rincon Ridge ceanothus are located on sites that are zoned for low-density residential development (i.e., suburban, rural residential, or exurban residential development), and many others are on sites with agricultural zoning designations (California Governor's Office of Land Use and Climate Innovation 2025).

[14] Percentage is based on the "Site Date" field of the CNDDB; excludes occurrences that have likely been extirpated.

Table 1. Loss and Degradation of Habitat Occupied by Rincon Ridge Ceanothus Caused by Agricultural and Developed Land Uses

	Agricultural-Developed Land[1]		
Occurrence Precision / CNDDB No.[2]	Percentage of Occurrence Area (%)[3, 4]	Within 100 m of Occupied Habitat?	Notes
Specific			
1	92	Y	Occurrence rank (viability) “fair” and trend “decreasing”; development a threat in the CNDDB
2	95	Y	Last surveyed in the 1960s
6	—	Y	—
10	<1	Y	Adjacent to road; occurrence rank (viability) “fair”
12	—	N	—
17	<1	Y	—
19	—	N	Development a threat in the CNDDB
21	18	Y	—
23	27	Y	Occurrence rank (viability) “fair”
24	—	Y	Occurrence rank (viability) “fair”; development a threat in the CNDDB
28	4	Y	Occurrence rank (viability) “fair”
30	—	Y	
32	—	N	Development a threat in the CNDDB
33	—	Y	Development a threat in the CNDDB
36	—	N	—
37	—	Y	—
38	—	N	—
Nonspecific			
7	6	U	—
8	—	N	—
9	52	U	“Extirpated” in the CNDDB
11	—	N	—
13	13	U	Last surveyed in 1933
14	—	N	—
18	36	Y	Last surveyed in 1940
20	3	U	—
22	14	U	—
26	—	U	Last surveyed in 1963
27	—	U	Site last surveyed in 1927
29	—	N	—
34	—	N	Last surveyed in 1963
35	9	U	—
39	—	U	—
40	—	N	—

Sources: CDFW 2024b, USGS 2021

Key: CNDDB = California Natural Diversity Database, m = meters, N = no, No. = number, U = unknown, Y = yes

Notes:

[1] – Based on the 2021 National Land Cover Database (USGS 2021), which was developed from 2016 imagery.

[2] – CNDDB occurrence numbers are not necessarily sequential.

[3] – Most mapping of CNDDB occurrences predates 2016, and thus, does not account for recent changes in land cover within occurrence boundaries. When mapped, specific occurrences contain little or no agricultural or developed land uses, the primary exception being roads. When mapped, nonspecific occurrences often include agricultural or

Table 1. Loss and Degradation of Habitat Occupied by Rincon Ridge Ceanothus Caused by Agricultural and Developed Land Uses

	Agricultural-Developed Land[1]		
Occurrence Precision / CNDDB No.[2]	Percentage of Occurrence Area (%)[3, 4]	Within 100 m of Occupied Habitat?	Notes

developed land uses because nonspecific occurrences do not represent the precise location of occupied habitat, but rather a larger area within which the location of occupied habitat is not precisely known.

[4] – Because of the level of precision of occurrence and land cover mapping, errors in land cover classification, and more recent changes in land cover, the extent of land cover conversion may be over or underrepresented at individual occurrences.

Disruptions to Post-Fire Recovery

Because fire kills Rincon Ridge ceanothus, the species' persistence depends on post-fire recruitment of new individuals from seed stored in the soil (i.e., the soil seed bank). Consequently, after a fire, occurrences of Rincon Ridge ceanothus are highly vulnerable to extirpation until seedlings have established new individuals and these individuals have reached maturity, begun to reproduce, and reformed the soil seed bank, which likely takes 10 years or longer (Keeley and Davis 2007). Competition from other plants (particularly invasive species), weather, herbivory, and human activities all impact post-fire recovery of Rincon Ridge ceanothus occurrences, and reoccurrence of fire within 10 years could remove all Rincon Ridge ceanothus shrubs before they reformed a soil seed bank. Because the landscapes containing some Rincon Ridge ceanothus occurrences are mosaics of natural, developed, and agricultural lands, and many occurrences are near agriculture, development, or roads, their exposure to human activities, infestations of invasive plants, and human-caused fire ignitions are all much greater than in an entirely natural landscape.

Vegetation Management to Reduce Fire Risks

To reduce wildfire risks to lives and property, state agencies together with local government agencies and other collaborators have been managing (treating) vegetation to reduce wildfire risks to lives and property. Substantial increases in the area of these treatments are planned (California Board of Forestry and Fire Protection 2019). The key treatments are the creation of firebreaks in strategic locations and fuel reduction by removing woody vegetation from wildlife-urban interfaces. Firebreaks are typically 300-foot-wide areas that are cleared of vegetation and maintained clear. The California Board of Forestry and Fire Protection has designated fuel reduction treatment areas and strategic firebreak locations throughout the range of Rincon Ridge ceanothus (California Board of Forestry and Fire Protection 2019). And, at least 12 occurrences of Rincon Ridge ceanothus are within 100 m (328 ft) of developed or agricultural land uses and thus in areas that may be prioritized for treatment. Therefore, fuel reduction treatments and firebreak creation may impact occurrences of Rincon Ridge ceanothus in the foreseeable future.

Climate Change

Climate change directly and indirectly threatens Rincon Ridge ceanothus by altering growing conditions, water availability, and frequency and intensity of disturbances, and by altering interactions of the plant with pollinators, dispersers, fungal symbionts, seed predators, herbivores, and competitors.[15] These consequences of climate change may also magnify the impacts of other threats.

The magnitude of climate change impacts on Rincon Ridge ceanothus is uncertain but may be substantial, particularly because of the species' limited range, rarity, habitat specificity, and distribution in relatively small and isolated areas that will be exposed to dramatic changes. Rincon Ridge ceanothus' vulnerability to climate change has not been directly assessed.[16] However, in a state-wide assessment of the vulnerability of vegetation to climate change, Thorne et al. (2016) concluded that the vegetation types providing habitat for Rincon Ridge ceanothus are moderately vulnerable to climate change.[17] Furthermore, in a state-wide analysis, Harrison et al. (2024) predicted that climate change will reduce the number of endemic plant species growing in portions of the current range of Rincon Ridge ceanothus.

H. Degree and Immediacy of Threat

Without additional management actions, there is a moderate to high likelihood that Rincon Ridge ceanothus will be extirpated from much of its range or become extinct because:

- Ongoing threats have already been eliminating or impacting occurrences of Rincon Ridge ceanothus, most occurrences are threatened, and the severity of some threats is increasing.
- Many of the species' occurrences are small in area, fragmented, or contain relatively few individuals, which increases its vulnerability to local extirpation or extinction from random events and human action.
- Many sites occupied by Rincon Ridge ceanothus are unprotected and not managed for conservation of this species, which leaves the species highly vulnerable to extirpation at most sites.

Each of these three reasons is described further in a separate section below.

Ongoing and Increasing Threats

As described previously, multiple threats have been affecting most Rincon Ridge ceanothus occurrences in the CNDDB. These threats have already eliminated or substantially degraded habitat at many of these occurrences:

- Two occurrences are likely to be extirpated because they are classified as extirpated in the CNDDB, or they have not been visited in ≥50 years and more than 90 percent of their

[15] The CNDDB does not include climate change in its standardized list of types of threats, and therefore, in the CNDDB, climate change is not identified as a threat to any species.
[16] "Vulnerability" to climate change is a product of exposure and sensitivity to changes in climate.
[17] Habitat types recorded in the CNPS Rare Plant Inventory are categories in the Holland vegetation classification and were matched to the corresponding categories in Thorne et al. 2016 using Holland 1986 and Sawyer et al. 2009, Appendix 3, The National Vegetation Classification Hierarchy as Applied to California Vegetation.

mapped area is now in agricultural or developed land cover (Table 1) (CDFW 2024b, USGS 2021).

- Six specific occurrences likely have been substantially degraded because their mapped area is partly in developed or agricultural land cover indicating that occupied habitat has been lost, degraded, or both. The portion in agricultural or developed land cover ranges from less than one percent to 95 percent, i.e., from negligible to near total direct loss of habitat.Four of these occurrences are also noted in the CNDDB as having only fair viability or a decreasing population trend based on observed quality of habitat and condition of the population at that location (Table 1) (CDFW 2024b, USGS 2021). [18]

Also, the viability of other occurrences may have been reduced by the effects of nearby agricultural or developed land uses, other site-specific threats (e.g., brush clearing), and climate change.

In sum, nearly a quarter of Rincon Ridge ceanothus occurrences have already been eliminated or substantially degraded by the threats described in Section G, "Factors Affecting Ability to Survive and Reproduce (Threats)," and these threats are still impacting many remaining occurrences.[19] Furthermore, the threats of climate change and vegetation management to reduce fire risks are likely to increase.

Small Number and Size of Occupied Sites

Species existing at small numbers of sites that are small in area and have few individuals are more vulnerable to extinction than species with more extensive distributions and larger population sizes. The smaller the number of occupied sites the greater the consequences for the species of site-specific random events or human actions. Also, occupied sites that are smaller in area and have fewer individuals are more vulnerable to extirpation by random events or human actions (e.g., Matthies et al. 2004, Vörös et al. 2025).

As described previously, Rincon Ridge ceanothus has a restricted distribution of less than three dozen occurrences, and nearly half of the remaining occurrences are small, fragmented, or contain few individuals.[20] (See Table 1 and Section D, "Abundance.") Therefore, Rincon Ridge ceanothus is vulnerable to extirpation from site-specific random events and human actions.

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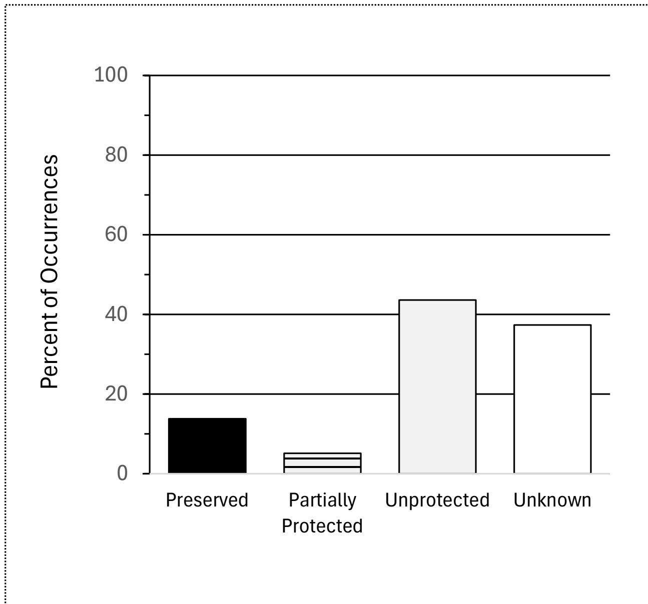
[18] Viability as noted in the CNDDB's "Occurrence Rank" field (i.e., overall condition or viability), whose categories are Unknown, Poor, Fair, Good, or Excellent.

[19] Occurrences ware considered substantially degraded if a specific occurrence and a portion of its mapped area is in agricultural or developed land cover.

[20] These are Occurrences 1, 6, 10, 12, 17, 19–21, 23, 28, 30, 32, 33, 36, and 37. Sites with 100 or fewer individuals were considered to contain "relatively few" individuals; sites less than or equal to approximately 2 hectares were considered small; and specific occurrences with agricultural or developed land uses in their mapped area were considered fragmented. Percentage excludes occurrences that have likely been extirpated.

Lack of Protection and Management

A large portion of Rincon ridge ceanothus occurrences are unprotected. Figure 1 displays the percentages of occurrences that are preserved, partially protected (i.e., on public lands managed for multiple uses) or preserved, unprotected, or have unknown protection status.[21] Forty-four percent of occurrences of Rincon Ridge ceanothus are unprotected, and of the 36 percent of occupied habitat whose status is unknown, a portion is also likely to be unprotected (CDFW 2024b, GIN 2024a, b; Figure 1). In contrast, less than 20 percent of occurrences are preserved or partially protected. At unprotected sites (and at partially protected sites), ongoing threats are rarely addressed and management actions to conserve species are rarely implemented. Consequently, at unprotected sites, Rincon Ridge ceanothus is highly vulnerable to extirpation, and because the majority of sites where Rincon Ridge ceanothus occurs are unprotected, the species is vulnerable to extinction.



Source: CDFW 2024b, GIN 2024a, b

Figure 1. Protection of Occurrences Presumed Extant

I. Impact of Existing Management Efforts

To date, management of Rincon Ridge ceanothus has been very limited, has not sufficiently addressed the threats described in Section G, "Factors Affecting the Ability to Survive and Reproduce (Threats)," and consequently has not resulted in significant conservation of the species. Below, this management is summarized by general type of action: legal protection, preservation and seed banking, management and monitoring, restoration, and surveys and research.

[21] This is based on USGS Gap Analysis Project (GAP) codes for conservation status as mapped by GIN with "preserved" corresponding to GAP Codes 1 and 2 (areas permanently protected from conversion of natural land cover and managed for biodiversity), "partially protected" corresponding to GAP Code 3 (areas permanently protected from conversion of natural land cover but managed for multiple uses, which may include resource extraction), and "unprotected" corresponding to GAP Code 4 (GIN 2024a, b; USGS No Date). Specific occurrences mapped in two status categories were proportionally assigned to both categories. Nonspecific occurrences were considered to have unknown status unless their entire mapped area was in only one status category. Occurrences that are likely extirpated were not included.

Legal Protection

Rincon Ridge ceanothus has no legal protections that mandate avoidance or full mitigation of impacts, consultations with regulatory agencies, or contributions to the species' recovery. It is not listed under CESA or the federal Endangered Species Act. It also is not covered by any natural community conservation plans (NCCPs) or habitat conservation plans (HCPs).

However, because CDFW has designated Rincon Ridge ceanothus a CRPR 1B.1 species, it should be treated as a special-status species during environmental review under the California Environmental Quality Act (CEQA) (i.e., as a species that may meet the requirements for CESA listing [CDFW 2024a]). Although CEQA requires lead agencies to adopt feasible avoidance, minimization, and mitigation measures to reduce impacts of nonexempt projects, it does not require that impacts on special-status species be avoided, fully mitigated, or even reduced to a less-than-significant level (if impacts are considered significant and unavoidable).

Similarly, the Bureau of Land Management (BLM) has designated Rincon Ridge ceanothus a sensitive species, and therefore, impacts on it should be considered during environmental review under the National Environmental Policy Act (NEPA), which may result in reduced impacts from actions by BLM.

Preservation and Seed Banking

Some occurrences of Rincon Ridge ceanothus are on protected land: approximately 14 percent of occurrences are on land managed for biodiversity (i.e., preserved) and 5 percent are on land managed for multiple uses (i.e., partially protected) (GIN 2024a, b). However, the majority of sites occupied by Rincon Ridge ceanothus remain unpreserved.

Seeds of Rincon Ridge ceanothus have been collected and placed in long-term storage at the Santa Barbara Botanic Garden (CNPS 2025).

Management and Monitoring

As described above, most occurrences of Rincon Ridge ceanothus are on land that is not managed for biodiversity. However, some are on land that is managed for biodiversity or for multiple uses (CDFW 2024b, GIN 2024a, b):

- Hood Mountain Regional Park and Open Space Preserve (Occurrence 36)
- M-G Ranch (Occurrence 10 in part)
- Montesol Ranch (Occurrence 30 in part)
- Robert Louis Stevenson State Park (Occurrences 12, 17 in part, and 38)

On these lands, managers seek to maintain habitats and routinely implement measures to avoid and minimize impacts to them. Habitats also may be enhanced or restored, but such actions are contingent on funding that typically is not available.

Managers also frequently monitor habitats or even species to guide their actions. However, at none of the sites occupied by Rincon Ridge ceanothus is systematic, formal monitoring of the species being conducted.[22]

Restoration

Efforts have not been made to restore or create habitat occupied by Rincon Ridge ceanothus.[23]

Surveys and Research

Surveys have not been conducted to confirm the continued existence of Rincon Ridge ceanothus at all documented occurrences, most of which have not been surveyed by a botanist during the past 20 years (CDFW 2024b, CNPS 2025). Surveys also have not been conducted to more precisely map the location of the 15 nonspecific occurrences that in CNDDB are presumed to be extant, the locations of which have not been precisely documented.

Furthermore, range-wide surveys of potential habitat have not been conducted to determine if additional, undocumented populations exist. (However, within the species' range, many localized botanical surveys have been conducted [e.g., for planning and permitting of specific projects].)

Research has not been conducted on the species' habitat requirements, growth, pollination, dispersal, population dynamics, or other aspects of its ecology.[24] However, its genus has been extensively studied, and the understanding of the ecology of its most similar congeners provides some understanding of the ecology of Rincon Ridge ceanothus.

J. Suggestions for Future Management

Successful conservation of Rincon Ridge ceanothus requires additional legal protection, preservation and seed banking, management and monitoring, restoration, and surveys and research. Suggestions for each of these general types of management actions are provided below.

Legal Protection

- List the species under CESA and prepare a recovery plan pursuant to California Fish and Game Code Section 2079.1.
- Include Rincon Ridge ceanothus as a focal species in any regional conservation investment strategy (RCIS) and as a covered species in any NCCP developed within its range.

Preservation and Seed Banking

- Preserve occupied sites in perpetuity with an emphasis on sites with the largest, most intact areas of habitat containing the largest populations of the species.

[22] Based on a review of publicly available information.
[23] Based on a review of publicly available information.
[24] Based on a review of publicly available information.

Management and Monitoring

- Develop and implement site-specific management plans for ensuring the long-term viability of Rincon Ridge ceanothus populations. These plans should include practices for monitoring, criteria for evaluating management, and potential management actions.
- Implement grazing practices that are compatible with or contribute to persistence of Rincon Ridge ceanothus.
- Implement fuel reduction treatments that are compatible with or contribute to the persistence of Rincon Ridge ceanothus.
- Implement measures to prevent recreational activities from impacting occupied habitat (e.g., trail rerouting).
- Establish a memorandum of understanding (MOU) with county transportation agencies regarding maintenance activities potentially affecting occupied habitat.
- Coordinate and share information among organizations working to conserve Rincon Ridge ceanothus, including CDFW and CNPS.

Restoration

- Restore occupied habitat that has been degraded by past impacts (e.g., revegetating areas damaged by ORVs).
- Establish additional populations at sites with suitable habitat, with a preference given to sites that will be provided with long-term protection and targeted monitoring and management of the species.

Surveys and Research

- Conduct surveys to improve data on distribution and abundance, including surveys to confirm persistence of historical occurrences, document the location of nonspecific occurrences, and search potentially suitable habitat for additional, undocumented populations of Rincon Ridge ceanothus.
- Document genetic diversity in and among occupied sites to inform conservation.
- Investigate the species' habitat requirements and population ecology to inform conservation and management (e.g., its seedbank dynamics).

K. Availability and Sources of Information

This document is based on available sources of information (i.e., publications and publicly distributed data) and communications with experts. This section provides a reference for each of these sources of information that was cited in this document.

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L. Detailed Distribution Map

Figure 2 provides a detailed map of the distribution of Rincon Ridge ceanothus that displays:

- Locations where the species has been documented, labelled with their CNDDB occurrence numbers
- Natural, agricultural, and developed land cover

Please note that the species may occur at unknown, undocumented sites that are not displayed on this map.

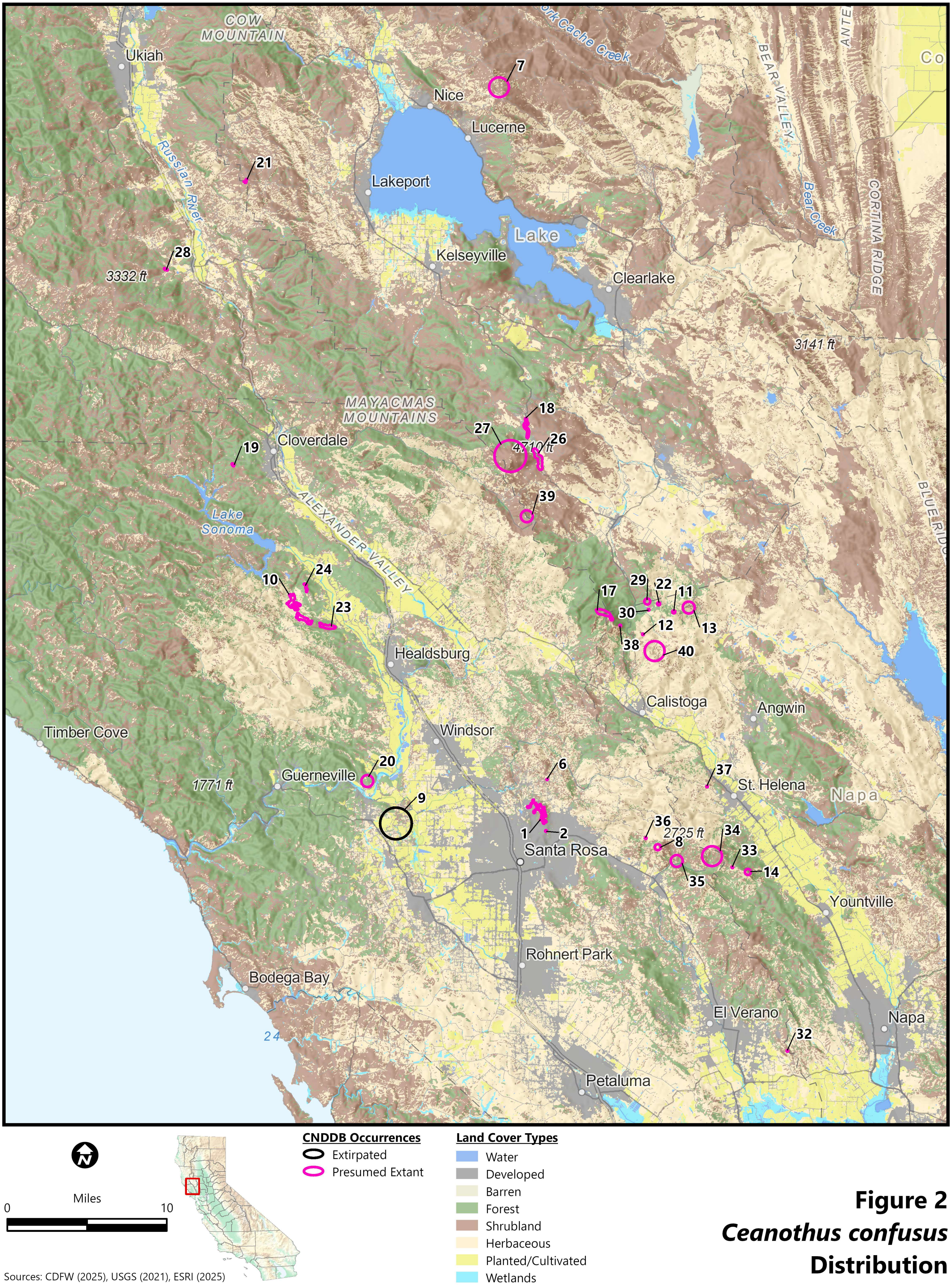

Figure 2
Ceanothus confusus
Distribution

Abbreviations and Acronyms

AOO	area of occupancy
BLM	Bureau of Land Management
CCH	California Consortium of Herbaria
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cm	centimeters
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
EOO	extent of occurrence
ft	feet
G1	Global Conservation Status Rank 1, Critically Imperiled
GAP	Gap Analysis Project
GIN	GreenInfo Network
HCP	habitat conservation plan
IUCN	International Union for the Conservation of Nature
m	meters
MOU	memorandum of understanding
NCCP	natural community conservation plan
NEPA	National Environmental Policy Act
ORV	Off-road vehicle
RCIS	regional conservation investment strategy
USGS	U.S. Geological Survey