Added to California Rare Plant Rank 1B.3 of the CNPS Inventory on May 30, 2018

Rare Plant Status Review: *Nama demissa* var. *covillei*
Proposed Addition to California Rare Plant Rank 1B.3, G5T3 / S3
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Changes made to the original document are in blue text.

Background and Taxonomy
Nama demissa var. *covillei* Brand is an annual herb in the Namaceae (formerly Hydrophyllaceae; see Luebert et al. 2016) known from Death Valley, Inyo and San Bernardino counties, California. It was originally described in 1913 by A. Brand and has no known synonyms (Tropicos 2018). It is included in *The Jepson Manual* (Bacon 1993), and *The Jepson Manual, Second Edition* (Taylor 2012) in the Hydrophyllaceae; the Namaceae treatment for the *Flora of North America* has not been published. *Nama demissa* var. *covillei* is most similar to, and can easily be misidentified as, *N. demissa* var. *demissa* (R. Kelley and J. Andre pers. comm. 2018). It is differentiated in having petioled leaves that are elliptic to diamond-shaped (vs. sessile leaves that are linear to spoon-shaped), and in having a general gray-green color (vs. a general green color in *N. demissa* var. *demissa*) (Taylor 2012). Although very similar, Jim Andre (pers. comm. 2018) has never found *N. demissa* var. *covillei* and var. *demissa* growing sympatrically. The specific epithet *demissa* means to hang down, and *covillei* refers to Dr. Frederick Vernon Coville, curator of the U.S. National Herbarium and Chief botanist of the USDA (Charters 2017).

Biology
Nama demissa var. *covillei* is known from Mojavean desert scrub at an elevation of -85 to 1,800 meters, with a blooming period of February to May (Taylor 2012). Its populations are often found to be bisected by roads. It does not range too far up or down slopes nor appear in washes. The treatment of varieties within *Nama demissa* may be more related to substrate than leaf shape, since leaf shape can be variable within the group (R. Kelley and J. Andre pers. comm. 2018). According to Taylor (2012), *Nama demissa* var. *covillei* is known from dry, sandy flats and slopes, whereas var. *demissa* is reported from sandy or gravelly flats and slopes. Jim Andre and R. Kelley (pers. comm. 2018) note that the core distribution of *N. d. covillei* is within Artist Palette of Death Valley National Park. Artist Palette consists of the Artist Drive Formation from the Miocene, and is made up of cemented gravel, playa deposits, and volcanic debris that is estimated to be up to 5,000 feet thick (USGS 2016). The elevation maximum of *N. demissa* var. *covillei* extends to 1,800 meters in the Kingston Range, and as low as -85 meters north of Bad Water, but its median elevation is approximately 640 meters. Potential associated species of *N. d. covillei* include: *Larrea tridentata, Ambrosia dumosa, A. salsola, Mohavea breviflora, Chylismia brevipes, Peucephyllum schottii, Cryptantha angustifolia, Phacelia calthifolia, Gilmanii luteola, Phacelia pedicellata, Atrichoseris platyphylla, Atriplex hymenelytra, Chylismia claviformis, Chaenactis carphoclinia,* and *Eremalche rotundifolia* (Consortium of California Herbaria 2018: GMDRC5503, GMDRC7940, GMDRC7941)

Distribution
Nama demissa var. *covillei* is currently known from an estimated 22 ~~21~~ occurrences in a narrow eastern portion of Death Valley National Park, the southernmost end being in the area of

Greenwater, California (R. Kelley and J. Andre pers. comm. 2018). Of the 22 ~~21~~ occurrences 13 (13/22 ~~21~~, ~60~~62~~%) are considered historical (occurrences not seen in over 20 years are considered historical by CNDDB). There is the potential for an additional five occurrences from collections outside of Death Valley National Park, from Imperial, Ventura, southern San Bernardino, and northwestern Inyo counties. However, these collections have been pointed out as questionable and require further verification. Detailed field study is needed in order to ascertain the circumscription and geographic limits of the varieties in *N. demissa* (D. Taylor pers. comm. 2018). It is suspected that additional occurrences of *N. demissa* var. *covillei* will be discovered; there is a considerable amount of potential habitat in areas that has not been surveyed in Death Valley National Park, and many areas are less travelled due to a lack of trails or roads. Furthermore, var. *covillei* is suspected to often be confused with its common relative, var. *demissa*, which could indicate that var. *covillei* is more common than currently known due to misidentifications. Confusing *N. demissa* var. *demissa* with var. *covillei* often comes from leaf width, which is a variable trait for these taxa. It is suspected that collectors see some variation in leaf width and determine plants to be var. *covillei* because it is the only other plant to fit the description. Another character trait in the *Jepson eFlora* (Taylor 2018) used to differentiate var. *covillei* from var. *demissa* is plant color, though plant color may merely be reflective of the density of its hairs and not actual coloration. The density and shape of hairs can aide in identification, but may not have received enough attention by botanists in the past (J. Andre and R. Kelley pers. comm. 2018).

According to Hitchcock (1933), "[t]he following collections are more or less intermediate between the variety *Covillei* and the variety *deserti*: Emigrant Spgs., Inyo Co. Parish 10198 (C, G. S); Mill Creek Canyon, Panimint Mtns, Inyo Co., Coville & Funston 758 (G, S); Randsburg, Kern Co., Heller 7701 (C, G, M. S)". "Of Hitchcock's intermediates, the first two cited collections are just west of the range for var. *covillei* as given in the ['Localities' section of the attached 'NewAdd_NamaDemissaCovillei'] spreadsheet, hence they ought to be incorporated into [C]NDDB with reference to their putative indeterminacy." (D. Taylor pers. comm. 2018).

Status and Threats

According to R. Kelley and J. Andre (pers. comm. 2018), *N. demissa* var. *covillei* is primarily found along roads and is therefore potentially threatened by road maintenance or construction within the Death Valley National Park. The type of habitat that *N. demissa* var. *covillei* requires is also continuously eroding and may eventually disappear as will the plant if it doesn't occupy another substrate—episodic rain weather patterns seen more recently (e.g., from global climate shifts) may speed this process (R. Kelley and J. Andre pers. comm. 2018). On the other hand, Death Valley National Park is very well managed and immediate threats to this species appear to not exist.

Summary

Based on the available information, CNPS and CNDDB recommend adding *Nama demissa* var. *covillei* to California Rare Plant Rank (CRPR) 1B.3 of the CNPS Inventory. Although it is suspected that additional occurrences will be found, its current distribution, low number of occurrences, and historical status of over half of its known occurrences indicate a status of CRPR 1B is warranted. If knowledge on the distribution, threats, and rarity status of *N. demissa* var. *covillei* changes in the future, we will re-evaluate its status at that time.

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Recommended Actions
CNPS: Add *Nama demissa* var. *covillei* to CRPR 1B.3
CNDDB: Add *Nama demissa* var. *covillei* to G5T3 / S3

Draft CNPS Inventory Record
Nama demissa A. Gray var. *covillei* Brand
Coville's purple mat
Namaceae
CRPR 1B.3
Inyo, San Bernardino
Kingston Peak (250B) 3511568, Dumont Dunes (251B) 3511662, Saddle Peak Hills (252A) 3511663, Avawatz Pass (252C) 3511654, Epaulet Peak (277A) 3511685, Gold Valley (300C) 3611616, Echo Canyon (323B) 3611646, Ryan (323C) 3611636, Furnace Creek (324A) 3611647, Devils Golf Course (324D) 3611637, Beatty Junction (346C) 3611658, Stovepipe Wells Ne (347A) 3611761, Fall Canyon (368C) 3611772, Ubehebe Crater (389C) 3711714
Mojavean desert scrub/ dry, sandy flats, slopes; often roadsides; elevation -85 to 1,800 meters.
Annual herb. Blooms February - May.
Potentially threated by road construction and maintenance. Possibly threatened by erosion, which might be exacerbated by climate shifts. Often misidentified as var. *demissa*. Leaf attachment and shape are primary differentiating characters between varieties, but these traits can be variable and substrate might be a better indicator of differentiation; needs further study. See *Das Pflanzenreich* IV. 251(59): 159 (1913) for original description, and American Journal of Botany 20(8): 518-534 (1933) for taxonomic treatment.

Literature Cited
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