Added to California Rare Plant Rank 1B.1 of the CNPS Inventory on August 31, 2015

Rare Plant Status Review: *Monardella sinuata* subsp. *gerryi*
Proposed Addition to California Rare Plant Rank 1B.1, G1 / S1

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July 27, 2015

Changes made to the original document are in blue text.

Background

Monardella sinuata Elvin & A.C. Sanders subsp. *gerryi* Elvin, A.C. Sanders & R.A. Burgess is an annual, erect herb in the Lamiaceae that is endemic to the Las Posas and Camarillo Hills west of the Santa Monica Mountains and southeast of the Santa Clara River in Ventura County, California. It was recently described by Elvin et al. (2015) and is therefore not included in *The Jepson Manual, Second Edition* (Sanders et al. 2012) or other state or regional floras known at the time of this writing. *Monardella sinuata* subsp. *gerryi* is named after Will Gerry, who owns the property where the plant occurs, and allowed access and directed Elvin et al. to suitable habitat where it grows. Subspecies *gerryi* is differentiated from the two other subspecies of *M. sinuata* (sspp. *sinuata* and *nigrescens*, which are both currently CRPR 1B.2 taxa) by leaf, pedicel, calyx, corolla, glomerule, and nutlet size, the presence of sparse conoideus glands along the stems, and a suite of pubescence features. It is most similar to subsp. *sinuata*, but differs in having shorter calyces (5.5-6 mm versus 7-8 mm in subsp. *sinuata*), glandular calyx trichomes, and longer nutlets (1.5-1.6 mm versus ca. 1.1 mm). *Monardella sinuata* subsp. *gerryi* is also geographically separated from the other two subspecies by the Santa Ynez Mountains of the Transverse Ranges. No intermediate specimens between subsp. *sinuata/nigrescens* and subsp. *gerryi* are known, and their geographic isolation implies a significant barrier to gene flow. Due to its significant geographic isolation and distinct morphological differences from the other *M. sinuata* subspecies, Elvin et al. (2015) considered recognizing *M. sinuata* subsp. *gerryi* at the rank of species. However, in recognizing their similarities, they erred on the side of caution and recognized it as a subspecies of *M. sinuata*, noting that further examination is necessary to determine if it warrants species recognition (Elvin et al. 2015).

Monardella sinuata subsp. *gerryi* occurs in sandy openings of coastal sage scrub at an approximate elevation of 150 to 243 meters. It occupies soils of the Las Posas Formation of the Pleistocene Age, which are derived from weakly consolidated sandstone with some gravelly sand units, and are highly susceptible to landsliding (Tan et al. 2004; Elvin et al. 2015). The microhabitats of *M. sinuata* subsp. *gerryi* include the following unique and uncommon taxa which are typically found in coastal maritime scrub or other arid environments: *Croton californicus*, *Eriastrum densifolium* subsp. *elongatum*, *Euphorbia polycarpa*, *Horkelia cuneata* subsp. *puberula*, *Mucronea californica*, and *Stillingia linearifolia*. Other common associates of the dominant coastal sage scrub community include: *Acmispon glaber*, *Artemisia californica*, *Eriogonum fasciculatum*, and *Salvia mellifera* (Elvin et al. 2015). Based on herbarium collections,

M. sinuata subsp. *gerryi* flowers from April to June (Consortium of California Herbaria 2015).

Monardella sinuata subsp. *gerryi* is currently only known from a single extant occurrence, from the southern coastal Las Posas and Camarillo hills in Ventura County, California. The entire occurrence is known from private property owned and managed by Will Garry. Its area of occupancy is estimated to be less than 1 km^2, and it's projected that only up to 1.84 km^2 of suitable habitat remains, all of which is either degraded or extremely fragmented (Elvin et al. 2015). Since the botanical exploration of southern California in the 1800's, only three collections of *M. sinuata* subsp. *gerryi* have been made. Two of the collections were made over 40 years ago (*Howe 4924*, 1976 and *French 311*, 1934) (Consortium of California Herbaria 2015) and are considered extirpated (Elvin et al. 2015). Both of the historical sites have been surveyed multiple times without success in finding *M. sinuata* subsp. *gerryi* (M. Elvin pers. comm. 2015). Elvin et al. (2015) "...estimate that the Las Posas and Camarillo hills at one time may have supported up to 15.64 km^2 of suitable habitat before modern human habitation in the area. The Las Posas and Camarillo hills have experienced considerable residential and agricultural development, particularly in the last 10 to 20 years, which has resulted in a considerable loss of habitat and increased fragmentation of the area." Although there are still some small fragments of habitat within the Las Posas and Camarillo hills that could harbor additional plants, Elvin et al. (2015) do not expect it to occur outside of this area; the nearby Conejo Mountains were formed from a different geological process and are composed of Conejo Volcanics, which weather to clay soils and support a different flora from the known area of occupancy of *M. sinuata* subsp. *gerryi*.

The landowners are aware of the occurrence of *M. sinuata* subsp. *gerryi* on their property and are doing what they can to protect it from threats; however, some threats exist that are beyond their control. *Monardella sinuata* subsp. *gerryi* is ~~potentially~~ threatened by invasive non-native plants such as *Euphorbia terracina* and *Eucalyptus globulus*. Another ~~potential~~ threat to this taxon is road clearing and maintenance for power transmission lines. Indirect effects from urbanization in the watershed also pose significant ~~potential~~ threats, including changes in hydrology due to groundwater pumping, changes in vegetation, and an increase in non-native species. Lastly, due to its very small population size and isolation, it is possibly threatened by inbreeding depression and potentially threatened by stochastic events such as fire, landslides, earthquakes, or prolonged drought (M. Elvin pers. comm. 2015). Due to these threats, its extremely limited extant distribution, and the fragmentation and degradation of its remaining potential habitat, *M. sinuata* subsp. *gerryi* was assessed by Elvin et al. (2015) as Critically Endangered (CR) according to IUCN (2001) standards.

Based on the available information, CNPS and CNDDB recommend promptly adding *Monardella sinuata* subsp. *gerryi* to California Rare Plant Rank 1B.1 of the CNPS Inventory. If additional information becomes available in the future which might constitute a change in the rarity or threat status of *M. sinuata* subsp. *gerryi*, we will re-evaluate its status at that time.

Recommended Actions
CNPS: Add *Monardella sinuata* subsp. *gerryi* to 1B.1
CNDDB: Add *Monardella sinuata* subsp. *gerryi* to G1 / S1

Draft CNPS Inventory Record
Monardella sinuata Elvin & A.C. Sanders subsp. *gerryi* Elvin, A.C. Sanders & R.A. Burgess
Gerry's curly-leaved monardella
Lamiaceae
CRPR 1B.1
Ventura
Newbury Park (113B)* 3411828, Moorpark (139C) 3411838, Santa Paula (140D)* 3411931
Coastal scrub / sandy openings; elevation 150 to 245 meters
Annual herb. Blooms April to June
Threatened by urbanization, agriculture, ~~and~~ habitat fragmentation~~. Potentially threatened by~~, road maintenance, hydrological alterations, and non-native plants. Possibly threatened by inbreeding depression and potentially threatened by stochastic events. See *Novon* 23(4):416-431 (2015) for original description.

Literature Cited
Consortium of California Herbaria (CCH). 2015. Data provided by the participants of the Consortium of California Herbaria. Regents of the University of California, Berkeley. Website http://ucjeps.berkeley.edu/consortium [accessed 29 May 2015].

Elvin, M.A., A.C. Sanders, R.A. Burgess, and B.J. Hellenthal. 2015. Three new subspecies of *Monardella* (Lamiaceae) from southern California, U.S.A. Novon 23(4):416-431. (Original description.)

IUCN. 2001. IUCN Red List Categories and Criteria Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.

Sanders, A.C., M.A. Elvin and M.S. Brunell. 2012. *Monardella*. Pp. 842-850, 853 *in* Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.), The Jepson manual: vascular plants of California, 2nd ed. University of California Press, Berkeley.

Tan, S.S., K.B. Clahan, and C.S. Hitchcock. 2004 Geological Map of the Camarillo 7.5' Quadrangle, Ventura County, California: A Digital Database, Version 10.0. Digital database by C.I. Gutierrez and M.T. Macorro. Prepared in cooperation with the U.S. Geological Survey, Southern California Areal Mapping Project. <ftp://ftp.consrv.ca.gov/pub/dmg/rgmp/Prelim_geo_pdf/Camarillo_prelim.pdf>.