Added to California Rare Plant Rank 1B.2 of the CNPS Inventory on December 31, 2013

Rare Plant Status Review: *Monardella sinuata* ssp. *nigrescens*
Proposed New Add to California Rare Plant Rank 1B.2, G2 / S2

Aaron E. Sims (CNPS) and Roxanne Bittman (CNDDB)
November 21, 2013

Changes made to the original document are in blue text.

Background

Monardella sinuata Elvin & A.C. Sanders subsp. *nigrescens* Elvin & A.C. Sanders is an annual herb in the Lamiaceae that is known from Point Reyes in Marin County, south to just south of Monterey Bay in Monterey County. It was recently described by Elvin and Sanders (2009) and is included in *The Jepson Manual, Second Edition* (Sanders et al. 2012; available online at http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=91104); the Lamiaceae treatment in the *Flora of North America* is not yet available. *Monardella sinuata* subsp. *nigrescens* (and subsp. *sinuata*, which is concurrently being evaluated for addition to the CNPS Inventory) has long been mistakenly called *M. undulata* Benth., a species that is currently a California Rare Plant Rank (CRPR) 4.2 taxon in the CNPS Inventory (2013; available online at http://www.rareplants.cnps.org/detail/643.html). Based on Elvin and Sanders (2009), *M. undulata* is now delineated into three subspecies, all of which are included in the CNPS Inventory (2013): subsp. *arguelloensis* (CRPR 1B.1), subsp. *crispa* (CRPR 1B.2, synonym *M. crispa*), and subsp. *undulata* (CRPR 1B.2, synonyms *M. frutescens* and *M. undulata* var. *frutescens*). Additionally, what is still included in the CNPS Inventory as *M. undulata* at the species level is actually representative of the two newly described taxa, *M. sinuata* subsp. *nigrescens* and subsp. *sinuata*. Therefore, *M. undulata* s.l. is simultaneously being proposed for deletion from the CNPS Inventory at this time.

The sheets with the type specimen of *M. undulata* contain more than one taxon, and the original description includes characters that apply to two different perennial species (Elvin and Sanders 2009). In his original description of *M. undulata*, Bentham (1834) described a plant that has a perennial or suffrutescent base or trunk, and refers to some characters that correspond with *M. crispa*, such as having procumbent basal stems (Elvin and Sanders 2009). Although *M. sinuata* has clear similarities with the other undulate-leaved *Monardella* taxa with which it has been typically associated, “it is more similar and appears to be more closely allied with *M. breweri*, *M. douglasii*, and other annual *Monardella* species, based on its leaf and bract morphology, pubescence, stature (herbaceous stems), the presence of glands on the tips of the upper petals, and especially its annual habit” (Elvin and Sanders 2009). The subspecific epithet of *M. sinuata* subsp. *nigrescens* refers to its black tips on the calyces and bracts and dark bract veins, which are used to distinguish it from subsp. *sinuata*. *Monardella sinuata* subsp. *nigrescens* also differs from subsp. *sinuata* in having wider, shorter bracts, larger glomerules (10-35 mm versus 10-25 mm wide for subsp. *sinuata*), and in being geographically separated (a northern distribution from Monterey County to the San

Francisco Bay Area versus southern distribution from San Luis Obispo County to Santa Barbara County for subsp. *sinuata*). *Monardella sinuata* subsp. *nigrescens* is known to flower mostly from May through July (Elvin and Sanders 2009). Two collections (*Thorne 34408, Keresztury CHSC67993*; Consortium of California Herbaria 2013) and one observational record (J. Greenhouse; Calflora 2013) indicate an early blooming period of April, and other records indicate a late blooming period of August (*Eastwood s.n., CAS25463*; *Suksdorf 786*; Consortium of California Herbaria 2013) (R. Sikora; CalPhotos 2013) (D. Styer pers. comm. 2013) to late September (D. Smith; CalPhotos 2013).

Monardella sinuata subsp. *nigrescens* is restricted to sandy soils in coastal dunes, dune scrub, and openings in coastal scrub (Elvin and Sanders 2009). At Point Reyes National Seashore (Pt. Reyes NS) it is mostly in open sandy areas just behind the first line of dunes along the coastline (D. Smith pers. comm. 2013). It also occurs in sandy openings of chaparral and in sandhills of ponderosa pine in Santa Cruz County (CNPS 2013; Consortium of California Herbaria 2013). *Monardella sinuata* subsp. *nigrescens* is known from an approximate elevation of sea level to 300 meters (Elvin and Sanders 2009).

Monardella sinuata subsp. *nigrescens* is currently only known from approximately 18 occurrences throughout the coast of Marin, San Francisco, Santa Cruz, and Monterey counties. It is presumed extirpated in San Francisco County, where known only from Lake Merced (San Francisco Recreation and Park Department 2006). All but one of its reported occurrences from herbarium collections are historical (occurrences not 'seen' in the past twenty years are considered historical by the CNDDB), the most recent being from near Felton, Santa Cruz County, in June of 1998 (*Taylor 16552*). However, occurrences of *M. sinuata* subsp. *nigrescens* (as *M. undulata*) at Pt. Reyes NS have been documented in the past twenty years by D. Smith (pers. comm. 2013) and others, as well as National Park Service staff due to its status as a CRPR 4 taxon. Subsequently, many field survey forms and occurrence reports for *M. undulata* from Pt. Reyes NS have been submitted to CNDDB in the past. Instead of incorporating these historical records into the locations spreadsheet, we are awaiting updated data from Pt. Reyes NS ecologists, A. Ryan and L. Parsons (pers. comm. 2013), who intend to submit their available data to the CNDDB.

At Pt. Reyes NS, numbers of *M. sinuata* subsp. *nigrescens* fluctuated considerably from year to year from hundreds to thousands of individuals. Most of its populations there lie along a 10 mile stretch from south of the Kehoe wetland to south of South Beach, with one population in the lee of an older inland dune field. Other annual CRPR 1B plants from similar habitats at Pt. Reyes NS (e.g., *Chorizanthe cuspidata* var. *villosa*, *Erysimum concinnum*, *Gilia capitata* subsp. *chamissonis*, *G. millefoliata*, *Hesperevax sparsiflora* var. *brevifolia*, and *Layia carnosa*) have large fluctuations in their population sizes from year to year, and therefore the status of *M. sinuata* subsp. *nigrescens* as a CRPR 1B taxon is supported (D. Smith pers. comm. 2013).

The occurrence of *M. sinuata* subsp. *nigrescens* (as *M. undulata*) at Fort Ord National Monument has also been recorded from the spring of 2009 to 2013 by D. Styer (pers. comm. 2013). Additional occurrences were reported from inland ranges of Army land by B. Delgado. The inland ranges where the occurrences lie are slated to become BLM ownership and part of Fort Ord National Monument, and are therefore considered protected (D. Styer pers. comm. 2013).

In its original description, *Monardella sinuata* subsp. *nigrescens* is noted as also occurring in Contra Costa, Santa Clara, and San Mateo counties (Elvin and Sanders 2009), though no paratypes from these counties were included in its description, and the locations were possibly included in error (A. Sanders pers. comm. 2013). It is possible that it occurs in San Mateo County, at least historically, but no specimens of *M. sinuata* subsp. *nigrescens* are currently known from this county (A. Sanders pers. comm. 2013; Consortium of California Herbaria 2013). It seems unlikely to occur in Contra Costa or Santa Clara counties (A. Sanders pers. comm. 2013); if it does occur there it is likely only in the very western portion of these counties, restricted to sand dunes and not widespread (M. Elvin pers. comm. 2013). The Consortium of California Herbaria (2013) records of *M. breweri* and *M. douglasii* (which are similar species to *M. sinuata* subsp. *nigrescens*) from Contra Costa County and records of *M. douglasii* from Santa Clara County are not likely to be mistakes in identity, and should not be tentatively treated as possibly *M. sinuata* subsp. *nigrescens* (M. Elvin and A. Sanders pers. comm. 2013) (no records of *M. breweri* exist from Santa Clara County and no records of *M. breweri* or *M. douglasii* exist from San Mateo County in the Consortium of California Herbaria, 2013). Although unlikely to occur in Contra Costa, Santa Clara, or San Mateo counties, *M. sinuata* subsp. *nigrescens* should be searched for in the extreme western portions of these counties in attempts to potentially locate additional occurrences. *Monardella sinuata* subsp. *nigrescens* should also be surveyed for in known areas in attempts to relocate historical populations, as well as nearby coastal areas with suitable habitat.

Monardella sinuata subsp. *nigrescens* is apparently mostly threatened by non-native plants and development. At Pt. Reyes NS, the population in the lee of an older inland dune field is threatened by the encroachment of European dune-grass, *Ammophila arenaria* (D. Smith pers. comm. 2013). Due to its coastal distribution, it is possible that occurrences of *M. sinuata* subsp. *nigrescens* outside of Pt. Reyes NS are threatened by coastal development, habitat loss, and fragmentation, which is threatening many other taxa that have a similar distribution (CNPS 2013). It is also possibly threatened by climate shifts, which is expected to have significant adverse effects to this taxon based on its similar circumstances to many federally listed species (M. Elvin pers. comm. 2013).

Based on the available information, CNPS and CNDDB recommend adding *Monardella sinuata* subsp. *nigrescens* to CRPR 1B.2 of the CNPS Inventory. The low number of occurrences, historical status of the majority of occurrences, and high amount of possible threats, indicate that *M. sinuata* subsp. *nigrescens* should be added to CRPR

1B.2. If additional information on the distribution and rarity status of this taxon becomes available in the future, it will be re-evaluated at that time.

Recommended Actions
CNPS: Add to 1B.2
CNDDB: Add to G2 / S2

Draft CNPS Inventory Record
Monardella sinuata Elvin & A.C. Sanders ssp. *nigrescens* Elvin & A.C. Sanders
northern curly-leaved monardella
Lamiaceae
CRPR 1B.2
Marin, Monterey, San Francisco*, Santa Cruz
Salinas (365B) 3612166, Marina (366A) 3612167, Monterey (366C) 3612158, Seaside (366D) 3612157, Felton (408D) 3712211, San Francisco South (448B)* 3712264, Drakes Bay (485C) 3812218, Inverness (485D) 3812217
Coastal dunes, coastal scrub, chaparral (SCR Co.), lower montane coniferous forest (SCR Co., ponderosa pine sandhills) / sandy; elevation 0 to 300 meters.
Annual herb. Blooms (April) May-July (August-September).
Threatened by non-native plants. Possibly threatened by development, habitat loss, habitat fragmentation, and climate shifts. Previously included in *M. undulata*. Similar to *M. breweri* and *M. douglasii.* See *Novon* 19(3):315-345 (2009) for original description.

Literature Cited
Bentham, G. 1834. *Monardella*. Pp. 331-333 in Labiatarum Genera et Species. James Ridgeway and Sons, London.

Calflora. 2013. Information on wild California plants for conservation, education, and appreciation. Accessed on 23 May 2013. Available online at http://www.calflora.org/.

California Native Plant Society (CNPS). 2013. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Available online at: http://www.rareplants.cnps.org.

CalPhotos. 2013. CalPhotos: Plants. Regents of the University of California, Berkeley. Accessed on 23 May 2013. Available online at: http://calphotos.berkeley.edu/flora/.

Consortium of California Herbaria. 2013. Data provided by the participants of the Consortium of California Herbaria. Regents of the University of California, Berkeley. Accessed on 23 May 2013. Available online at: http://ucjeps.berkeley.edu/consortium/.

Elvin, M.A. and A.C. Sanders. 2009. Nomenclatural changes for *Monardella* (Lamiaceae) in California. Novon 19(3): 315-345.

San Francisco Recreation and Park Department. 2006. Significant Natural Resource Areas Management Plan, Final Draft. 6.1-5 Sensitive Plant Species.

Sanders, A.C., M.A. Elvin, and M.S. Brunell. 2012. Monardella. Pp. 842-850 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, second edition. University of California Press, Berkeley, Los Angeles, London.