Retained as California Rare Plant Rank 2B.2 in the CNPS Inventory on 19 November 2020

Rare Plant Status Review: *Montia howellii*
Proposed Change from California Rare Plant Rank 2B.2, G3G4 / S2 to 4.3, G4 / S3

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Changes made to the original document are in blue text.

This species review is being expedited though a challenge cost share agreement between the California Native Plant Society and the USDA Forest Service, Pacific Southwest Region. Aside from being advanced as part of this agreement, the process, content, and information provided herein is not altered, modified, or developed differently in any way or form compared to other status reviews developed by CNPS.

Background and Taxonomy
Montia howellii Wats. is an annual herb in the Montiaceae known from Humboldt and Trinity counties in California, and north to Oregon, Washington, and into British Columbia, Canada. It has been included in the *CNPS Inventory* since the fifth edition (Skinner and Pavlik 1994; CNPS 2019). With a large number of occurrences, and over half of them ranked excellent or good in the CNDDB, *M. howellii* has been proposed for a rank change from 2B.2 to 4.3.

Ecology
Montia howellii occurs in vernally mesic meadows and seeps, North Coast coniferous forest, and vernal pools, sometimes along roadsides. In California it occurs at an approximate elevation of 0 to 835 meters and flowers between March to May, sometimes flowering as early as January and February. *Montia howellii* has flowers that are generally cleistogamous as well as small, only being millimeters in length. These small flowers along with a plant that ranges from one to nine centimeters in height, present difficulties while surveying. More information about *M. howellii* can be found in the *CNPS Inventory* at http://www.rareplants.cnps.org/detail/1728.html.

Distribution and Abundance
In California, *Montia howellii* is currently known from a total of 114 occurrences. Of the 114 occurrences seven are considered historical (occurrences not seen in the past 20 years are considered historical by the CNDDB), one is presumed extirpated, and five are considered possibly extirpated. Sixty-three occurrences are considered “excellent” or “good” (A or B), while 25 are ranked “fair” (C), 12 are ranked “poor” (D), eight are ranked “unknown” (U), and six are ranked “none” (X; indicating they are presumed or possibly extirpated) in the CNDDB (2020). The population sizes of *Montia howellii* are fairly well known, with data available for 110 of the 114 occurrences. Thirty-five of the occurrences have population count/estimates of 500 or more individuals. Based on the available data, the total number of known individuals of *M. howellii* is estimated to be over 1,100,000 plants (population count/estimate data is available in the attached “MontiaHowellii_20200303_change” spreadsheet). The majority of the occurrences (96) are on private land, eight are found on state or federal lands, and ten are found on lands of unknown ownership.

Although we don't know the precise number of occurrences of *M. howellii* when it was first added to the Inventory in 1994, we do know that was known from five USGS 7.5" quadrangles, stemming from seven collections at that time, whereas it is now known from 37 quadrangles, an increase of 32 quads in 26 years. In April of 2017, *M. howellii* was proposed for a rank change and at that time it was known from 97 occurrences with 51 occurrences ranked as A or B, showing an increase of 17 occurrences over the past three years. Each year new occurrences have been detected, with 42 additional source documents currently waiting to be processed by the California Natural Diversity Database, and the number of occurrences are expected to increase with additional surveys and reporting. There is a general sense that there are populations that have been overlooked, potentially due to how early it is seen in the season and how small the plant is (J. Regan pers. comm. 2020, J. Kierstead pers. comm. 2020).

Outside of California, *M. howellii* is considered Vulnerable (S3) in Washington, Vulnerable to Apparently Secure (S3S4) in Oregon (ORBIC 2019), and Apparently Secure (S4?) in British Columbia, Canada (NatureServe 2019). While *M. howellii* was changed from S3 to S3S4 in Oregon (ORBIC 2019), it is still considered a Candidate for state listing in Oregon (ODA 2018). According to NatureServe (2019), there appear to be nearly 150 extant occurrences of *M. howelii* rangewide, mostly in California and Oregon, though with 114 occurrences in California alone, this estimate appears like it could be on the low side.

Status and Threats

The majority of *M. howellii* occurrences (102) have listed threats in the CNDDB. Half or more of these occurrences are noted to be threatened by direct or indirect impacts of timber harvest activities, including logging (75), road construction (83), and foot traffic (12). Additional threats noted include non-native plants, altered hydrological regime, grazing, and vehicles.

While *Montia howellii* is documented to be threatened by disturbance events, it has been shown that it is actually dependent on mild disturbance and may be best managed by seasonal disturbance. A six-year study of roads found within the Humboldt Redwood Company timberlands was conducted in order to determine the response of *M. howellii* to road management in the area (Renner et al. 2011). In order to achieve this, Renner et al. (2011) selected several roads with varying levels of disturbance throughout the year and performed counts of individual plants in each population along the roads. The study found that populations on roads that had been seasonally used tended to increase in plant number and area, whereas roads that were completely closed off saw a decline in population, and an increase in non-native grasses. Additionally, roads that had continuous use or heavy disturbance also saw a decline in *M. howellii* plant numbers and population size (Renner et al. 2011). These observations have also been expressed by those who work with *M. howellii* in the field, with the general indication being that the plant responds well and often seems to require some disturbance to thrive (J. Kierstead, D. Taylor, L. Lindstrand III, L. Sims, J. Regan, pers. comms. 2020). A study monitoring *Montia howellii* from the early 1990's found similar observations, with results indicating that populations increase immediately after a disturbance, followed by a decline in the population after a lack of disturbance (Kaye 1992). A follow up study by Kaye (1992a) investigated the seed bank and germination capabilities of *M. howellii*, finding that the species exhibits a large seed bank with seeds that can lay dormant and persist in habitats that have become unsuitable, and then recolonize after disturbance.

Summary
With 63 occurrences ranked as "excellent" or "good" by CNDDB, along with its tolerance for mild disturbance, *Montia howellii* has met the general level of meriting down ranking from California Rare Plant Rank 2B.2 to 4.3 (in general, California Rare Plant Rank 1B contains plants that are known from fewer than 50 occurrences ranked as "excellent" or "good" by CNDDB). *Montia howellii* is not exhibiting a trend towards extirpation in California, and data has shown an increase number of known occurrences since being listed by CNPS in 1994.

Based on the available information, CNPS and CNDDB recommend re-ranking *Montia howellii* from California Rare Plant Rank 2B.2 to 4.3. If occurrences of *M. howellii* in California begin to trend downward, and/or if threats to its survival increase, CNPS and CNDDB will re-evaluate its status at that time.

Based on the comments received a consensus regarding this change could not be made at the scheduled time of review closure. We therefore discussed the conservation status of *Montia howellii* in California and the proposal to downrank it from 2B.2 to 4.3 at a recent Rare Plant Program Committee (RPPC) meeting held on 12 November 2020. Based on the outcome of that meeting, CNPS and CNDDB have decided not to downrank *Montia howellii* at this time. While most CRPR 1B and 2B plants are known from less than 50 occurrences in California, *Montia howellii* will remain among several other CRPR 1B and 2B plants with over 100 occurrences in California.

Recommended Actions
CNPS: Change *Montia howellii* from CRPR 2B.2 to CRPR 4.3
CNDDB: Change *Montia howellii* from to G3G4 / S2 to G4 / S3

Final Actions
CNPS: Retain *Montia howellii* as CRPR 2B.2

Current CNPS Inventory Record
Montia howellii Wats.
Howell's montia
Montiaceae
CRPR 2B.2
Humboldt (HUM), Trinity (TRI)
Fort Seward (616B) 4012326, Miranda (617A)* 4012327, Briceland (617C)* 4012318, Larabee Valley (634B) 4012346, Blocksburg (634C) 4012336, Bridgeville (635A) 4012347, Redcrest (635B) 4012348, Myers Flat (635D) 4012337, Scotia (636A) 4012441, Taylor Peak (636B) 4012442, Buckeye Mtn. (636C) 4012432, Bull Creek (636D) 4012431, Capetown (637A) 4012443, Mad River Buttes (653A) 4012367, Iaqua Buttes (653B) 4012368, Owl Creek (653C) 4012358, Yager Junction (653D) 4012357, McWhinney Creek (654A) 4012461, Fields Landing (654B) 4012462, Fortuna (654C) 4012452, Hydesville (654D) 4012451, Ferndale (655D) 4012453, Ironside Mtn. (669C) 4012374, Salyer (670A)* 4012385, Willow Creek (670B) 4012386, Hennessy Peak (670D) 4012375, Lord-ellis Summit (671A) 4012387, Korbel (671C) 4012378, Maple Creek (671D) 4012377, Arcata North (672A) 4012481, Eureka (672C) 4012472, Arcata South (672D) 4012471, Weitchpec (687B) 4112326, Bald Hills (688B)

4112328, Panther Creek (688C) 4112318, Hupa Mountain (688D) 4112317, Orick (706D) 4112431
Meadows and seeps, North Coast coniferous forest, vernal pools / vernally mesic, sometimes roadsides; elevation 0 – 835 meters.
Annual herb. Blooms (January to February) March to May.
Rediscovered in CA in 1999 by Clare Golec. Did plant occur in DNT Co.? Threatened by logging, road construction, road maintenance, vehicles, and competition. Possibly threatened by non-native plants. Candidate for state listing in OR. Sometimes mistaken for *M. fontana* or *M. dichotoma*. See *Proceedings of the American Academy of Arts and Sciences* 18:191 (1883) for original description.

Revised CNPS Inventory Record
Montia howellii Wats.
Howell's montia
Montiaceae
CRPR 2B.2 ~~4.3~~
Humboldt (HUM), Trinity (TRI)
Fort Seward (616B) 4012326, Miranda (617A)* 4012327, Briceland (617C)* 4012318, Larabee Valley (634B) 4012346, Blocksburg (634C) 4012336, Bridgeville (635A) 4012347, Redcrest (635B) 4012348, Myers Flat (635D) 4012337, Scotia (636A) 4012441, Taylor Peak (636B) 4012442, Buckeye Mtn. (636C) 4012432, Bull Creek (636D) 4012431, Capetown (637A) 4012443, Mad River Buttes (653A) 4012367, Iaqua Buttes (653B) 4012368, Owl Creek (653C) 4012358, Yager Junction (653D) 4012357, McWhinney Creek (654A) 4012461, Fields Landing (654B) 4012462, Fortuna (654C) 4012452, Hydesville (654D) 4012451, Ferndale (655D) 4012453, Ironside Mtn. (669C) 4012374, Salyer (670A)* 4012385, Willow Creek (670B) 4012386, Hennessy Peak (670D) 4012375, Lord-ellis Summit (671A) 4012387, Korbel (671C) 4012378, Maple Creek (671D) 4012377, Arcata North (672A) 4012481, Eureka (672C) 4012472, Arcata South (672D) 4012471, Weitchpec (687B) 4112326, Bald Hills (688B) 4112328, Panther Creek (688C) 4112318, Hupa Mountain (688D) 4112317, Orick (706D) 4112431
Meadows and seeps, North Coast coniferous forest, vernal pools / vernally mesic, sometimes roadsides; elevation 0 – 835 meters.
Annual herb. Blooms (January to February) March to May.
Retained as ~~Changed from~~ CRPR 2B.2 ~~to 4.3~~ on 2020-11-19 ~~XX-XX~~
Rediscovered in CA in 1999 by Clare Golec. More common than originally known. Did plant occur in DNT Co.? Threatened by logging, road construction, road maintenance, and vehicles, though typically responds well to mild, seasonal disturbance. Possibly threatened by non-native plants. Candidate for state listing in OR. Sometimes mistaken for *M. fontana* or *M. dichotoma*. See *Proceedings of the American Academy of Arts and Sciences* 18:191 (1883) for original description.

Literature Cited
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Skinner, M. W. and B. M. Pavlik (eds.). 1994. *California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California*. Special Publication No. 1 (Fifth Edition). California Native Plant Society, Sacramento. 338 pp.