# Priority Conservation Ranking of Federally Listed, State Endangered and other Plant Species of Concern

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**Introduction**

Natural Heritage New Mexico (NHNM) worked with Daniela Roth of the State Forestry Division of the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) to update New Mexico conservation status ranks for 31 sensitive plant species in New Mexico following the standards developed by NatureServe and the national network of Natural Heritage programs (Faber-Langendoen et al. 2009; Table 1). Conservation status ranks are an estimate of extinction risk (S1 = Critically Imperiled, S2 = Imperiled, S3 = Vulnerable, S4 = Apparently Secure, S5 = Secure). These ranks can be used to prioritize conservation actions. For instance, the Bureau of Land Management (BLM) considers state conservation ranks for inclusion and updates of their sensitive species list. Ranks may sometimes be the only available information regarding the conservation status of a species, which is particularly true for plants (Evans et al. 2016). Natural Heritage programs tend to focus their data collection and research goals on species with relatively high conservation status ranks (S1 – S3).

Species were selected if there were recent data collection efforts that warranted review, when they were last ranked, or if they lacked a rank (i.e. SNR in Table 1) but were considered species of concern on other lists (NMRPTC 1999). Accordingly, recently collected data (from EMNRD and NHNM) and legacy data (U.S. Forest Service and BLM) were added to the New Mexico Conservation Information System maintained by NHNM. The data consolidation process involved creating and updating element occurrences (EOs). EOs are the NatureServe standard for delineating populations based on the distance (separation distance) between mapped locations in the absence of population genetic data. The number and quality of EOs is a key determination factor of ranks. Relatively new standards for plants specify that EO separation distance varies depending on the suitability of habitat between mapped locations where the separation distance is larger if there is available suitable habitat features but the distance is smaller if the habitat is not suitable (NatureServe 2004).

Prior to 2012, New Mexico state conservation status ranks maintained by NHNM were qualitatively assessed by local subject-area experts. In 2012, NHNM adopted the NatureServe rank calculator to assess conservation status ranks more quantitatively (Faber-Langendoen et al. 2009). The rank calculator uses factors that were likely implicitly considered during previous species ranking by experts. There three fundamental factors that go into ranks: population numbers and extent (No of EOs),

population trends, and threats that may impact the species in the future. Factors are weighted to output a suggested rank that is then reviewed (Master et al. 2009). In the review step, species experts approve and finalize the rank. At this step, the rank may be adjusted relative to information not captured by the calculator or relative to other species. There are five basic status ranks (S1 = Critically Imperiled, S2 = Imperiled, S3 = Vulnerable, S4 = Apparently Secure, S5 = Secure). Here, we only considered species with S1 through S3 ranks.

The rank calculator is advantageous for several reasons. Ranks are quantitatively assessed based on existing information. The rank calculator facilitates consistent and repeatable comparisons among species, over time, and across geopolitical lines. For example, rank factors at the state or province level across the range of a species can be relatively easily consolidated to generate national and global rank updates because the same ranking framework is being applied across jurisdictional lines. Additionally, the calculator incorporates a threat assessment based on a standardized list of threats compiled by Salafsky et al. (2008). Lastly, during the ranking process, data gaps and uncertainties can be identified that can help guide management priorities and future monitoring efforts.

**Results**

We focused on species that had not been ranked or had their ranks updated within the last 15 years. That is of the 31 species chosen, five plant species had not been previously ranked and 24 had not been updated since before the year 2000. Two species had been ranked more recently, but new information prompted a review of the 2012 ranks (*Phacelia cloudcroftensis, Mentzelia todiltoensis*). Details of how current ranks were derived for each species are available on request and will be visible on the NHNM website (nhnm.unm.edu). The rank review resulted in a change for 42% of the 26 plants that had previously been ranked (Figure 1). For 7 species the rank moved upward (e.g. from S2 to S1) indicating a trend towards greater imperilment. Two species jumped two steps from S3 to S1, *Anticlea mogollonensis* (Mogollon death camas) and *Erigeron subglaber* (Pecos fleabane). Four species dropped rank (e.g., S1 to S2) and appeared more secure since the last assessment, particularly *Mentzelia todiltoensis* (Todilto Stickleaf), which dropped from an S1 to S3. New information and delineating EOs using new data standards are the primary reasons for changes in rank status. Among the five previously unranked species, it is noteworthy that three were ranked as S1 yet were only identified as "species of concern" by other agencies (*Agalinis calycina* (Leoncita false foxglove), *Paronychia wilkinsonii* (Wilkinson's nailwort), and *Penstemon metcalfei* (Metcalfe's penstemon)). This may be partly due to the lack of baseline information on the occurrence and status of these species. The ranking process functions as a tool to identify the most imperiled species in New Mexico, identifies data gaps, and alerts to changes in species status based on the most current data available, which can significantly contribute to guiding management priorities and determining the conservation status and needs of sensitive species.

Overall, the species-specific data provided here within the rank calculator framework can provide a foundation for addressing inventory, monitoring, and management needs to provide conservation direction for New Mexico's most imperiled species. Using the rank calculator in the future, ranks can be

adjusted efficiently as new data becomes available, leading to well documented status assessments of sensitive plant species around New Mexico.

**Table 1**. Plant species ranked in 2015-2016 (S1 = Critically Imperiled, S2 = Imperiled, S3 = Vulnerable, S4 = Apparently Secure, S5 = Secure).

| Scientific Name | Common Name | Old Rank | Last Review | New Rank |
|---|---|---|---|---|
| *Echinocereus fendleri var. kuenzleri* | Kuenzler's hedgehog cactus | S3 | 10/14/1988 | S2 |
| *Aliciella formosa* | Aztec gilia | S2 | 11/10/1997 | S2 |
| *Peniocereus greggii var. greggii* | Night-blooming cereus | S2 | 6/26/1995 | S3 |
| *Erigeron rhizomatus* | Zuni fleabane | S2 | 10/14/1988 | S1 |
| *Amsonia tharpii* | Tharp's blue-star | S1 | 3/26/1991 | S1 |
| *Abronia bigelovii* | Tufted sand verbena | S3 | 10/27/1982 | S2 |
| *Allium gooddingii* | Goodding’s onion | S1 | 9/17/1997 | S2 |
| *Helianthus paradoxus* | Pecos sunflower | S2 | 1/20/1997 | S2 |
| *Cirsium vinaceum* | Sacramento Mountains thistle | S2 | 10/27/1982 | S1 |
| *Hedeoma todsenii* | Todsen's pennyroyal | S2 | 3/25/1991 | S2 |
| *Escobaria sneedii var. sneedii* | Sneed's pincushion cactus | S2 | 3/8/1989 | S2 |
| *Scrophularia macrantha* | Mimbres figwort | S2 | 9/26/1983 | S2 |
| *Townsendia gypsophila* | Gypsum Townsend's aster | S2 | 1/28/1997 | S2 |
| *Pediomelum pentaphyllum* | Chihuahua scurf pea | S1 | 12/9/1998 | S1 |
| *Cirsium wrightii* | Wright's marsh thistle | S2 | 7/29/1997 | S2 |
| *Escobaria sneedii var. leei* | Lee's pincushion cactus | S2 | 12/22/1989 | S2 |
| *Argemone pinnatisecta* | Sacramento prickly poppy | S2 | 3/7/1994 | S2 |
| *Ionactis elegans* | Sierra Blanca cliff daisy | S2 | 3/25/1991 | S2 |
| *Sclerocactus cloverae ssp. brackii* | Brack hardwall cactus | S1 | 12/10/1997 | S2 |
| *Coryphantha scheeri var. scheeri* | Scheer pincushion | S2 | 8/10/1989 | S2 |
| *Penstemon metcalfei* | Metcalfe's penstemon | SNR | | S1 |
| *Anticlea mogollonensis* | Mogollon death camas | S3 | 7/30/1997 | S1 |
| *Packera cardamine* | Heartleaf groundsel | S3 | 1/31/1991 | S2 |
| *Hieracium brevipilum* | Mogollon hawkweed | S2 | 5/1/1992 | S2 |
| *Agalinis calycina* | Leoncita false foxglove | SNR | | S1 |
| *Paronychia wilkinsonii* | Wilkinson’s nailwort | SNR | | S1 |
| *Phacelia cloudcroftensis* | Cloudcroft scorpionweed | S1 | 2/6/2012 | S1 |
| *Phacelia sivinskii* | Sivinski’s scorpionweed | SNR | | S3 |
| *Rhodiola integrifolia ssp. neomexicana* | New Mexico stonecrop | SNR | | S2 |
| *Erigeron subglaber* | Pecos fleabane | S3 | 3/11/1994 | S1 |
| *Mentzelia todiltoensis* | Todilto Stickleaf | S1 | 12/1/2012 | S3 |

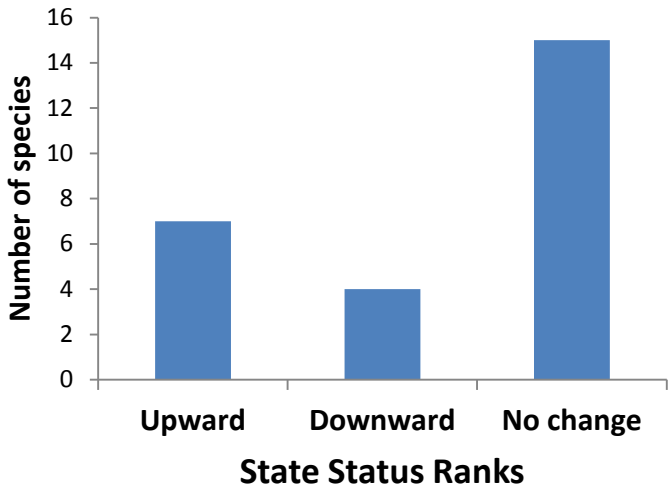


**Figure 1**. Direction of rank changes for previously ranked plants.

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