

The California Natural Diversity Database
(CNDDDB) and California Native Plant Society
(CNPS) Cooperative Relationship and Rare Plant
Status Review Process

The California Natural Diversity Database

The California Native Plant Society

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Disclaimer:

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Background

The California Natural Diversity Database (CNDDDB) and the California Native Plant Society's Rare Plant Program (CNPS) are two separate entities that work collaboratively to determine which plant taxa in California should be included in the CNDDDB's [*Special Vascular Plants, Bryophytes, and Lichens list*](#) and in CNPS' [*Inventory of Rare and Endangered Plants*](#). While both programs have their own rarity ranking system (see Appendix B), the two programs work together when evaluating rarity status of plants to reduce duplication of effort. This document summarizes the history behind the working relationship between the CNDDDB program and CNPS and gives an overview of the process used for determining plant rarity.

History of the CNDDDB and CNPS Cooperative Agreement

The tracking of rare plant information¹ has a long and collaborative history in California. It all began with the California Native Plant Society (CNPS) which spawned a Rare Plant Program (RPP) in 1968. The CNPS RPP created a large card file of all plants known to botanists at the time with a distribution of less than 100 miles². This early card file served as the foundation for the first CNPS *Inventory of Rare and Endangered Plants* (the CNPS *Inventory*), published in 1974.

In 1979, The Nature Conservancy (TNC) began its California version of a Natural Heritage Program, then housed on the campus of California State University Sacramento. Natural

¹ "Rare plant information" as used here includes both data on taxonomy and data on occurrences.

² Information in Philip Munz's *A California Flora* was used to estimate distributions.

Heritage programs were designed to track all special status plants, animals, and natural communities in a state or province, with the objective of sharing those data with species conservationists, land managers, and planners. An agreement between TNC and CNPS was made so that all CNPS botanical data could be shared with the incipient Heritage program. The concept was that a cooperative endeavor between CNPS and the Heritage Program would reduce duplication of effort, be more efficient, and be more cost effective for both parties. This philosophy was further emphasized in 1981 when the Heritage Program was turned over to State government within the then California Department of Fish and Game. The transfer of the Heritage Program to the State was done via Assembly Bill 1039, and the new state entity was renamed the California Natural Diversity Database (CNDDDB). With TNC now more of a legacy founder³, there were changes in both funding and management, and a new agreement between CNPS and the CNDDDB program was proposed. This new agreement maintained the same working relationship, and clarified that CNPS had to fund a full-time Rare Plant Botanist position, while the CNDDDB program had to provide work space and access to data. This unprecedented cooperative agreement was entered into in 1981 and the arrangement continues to the present, currently in the form of a Memorandum of Understanding between CDFW and CNPS (last renewed in 2000).

This type of cooperative agreement between a private and public entity, with the goal of maintaining and enhancing the knowledge of the plant biology of a state (or province) is uncommon. Though the data sharing piece has not changed, and still serves both parties

³ The Nature Conservancy continued to sponsor various Heritage programs until the year 2000, when a new organization was formed, NatureServe. NatureServe continues to the present day in coordinating 80 Network programs throughout the Western Hemisphere.

extremely well, the process by which plants are reviewed and added or deleted from various lists has evolved over time.

The Rare Plant Status Review Process

In the 1980's, 1990's, and early 2000's, review of potential changes to the CNPS *Inventory* and to the CNDDDB List of Special Plants (now the CNDDDB *Special Vascular Plants, Bryophytes and Lichens List*) was done by in-person meetings held all over the state and co-led by the CNPS Rare Plant Botanist and the CNDDDB Botanist. This method had advantages, but was time-consuming and expensive, resulting in long gaps between printed editions of the CNPS *Inventory*. It was replaced in 2005 by email groups and an online forum-based process. This new process was far less expensive and more efficient, it improved transparency and responsiveness, and allowed for the involvement of more experts from throughout California, as well as outside the state. Around this same time, there was also a proliferation of high quality online data, such as the [Consortium of California Herbaria dataset](#), which greatly improved the review of proposed changes to the lists.

The current Rare Plant Status Review process is very efficient and allows for the participation of botanical experts from all over the world. The resulting NatureServe Conservation Status Ranks and California Rare Plant Ranks (CRPR) are used widely by state agency biologists, consultants, local planners, and federal agencies such as the US Fish and Wildlife Service and US Forest Service (see Appendix B for additional information on both of these ranking systems). These ranks serve to call attention to the numerous rare plants with no official state or federal designations under either the California Endangered Species Act (CESA) or the federal Endangered Species Act (ESA). It is important to note that there are over 1,900 rare plants in California with no federal or

state endangered species status. Because of the efforts of the CNDDDB program and CNPS to bring attention to rare plants through these parallel ranking systems, these plants receive some attention via the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

How the Current Rare Plant Status Review⁴ System Works⁵

- CNPS maintains a file of all proposed additions, deletions, and changes to the CNPS *Inventory* and CNDDDB *Special Vascular Plants, Bryophytes, and Lichens List*. Botanists from any agency, company, or entity can submit a proposal, but it must be supported by data⁶ to be considered (see Appendix A or visit the CNPS webpage for more details).
- The CNPS Rare Plant Botanist selects a plant for review, and CNPS and CNDDDB staff begin a detailed research effort to gather all available information on that taxon. This information is not restricted to field survey forms, office files, or other sources of data submitted to the CNDDDB program; it also includes numerous online data sources, scientific papers where available, and personal correspondence with experts.
- A draft Rare Plant Status Review document is prepared by CNPS staff and forwarded to CNDDDB staff for review and edit.

⁴ “Status Review” refers to the process where a change to the list of special status plants is proposed. This change could be an addition, deletion, or change in rank.

⁵ For a complete flowchart of the process, see Appendix A.

⁶ Only proposals backed up by credible data are considered.

- The final Rare Plant Status Review, displaying the authors as both the CNPS Botanist and the CNDDDB editor, is distributed digitally to experts who previously expressed interest in plants in a geographic region or in a particular group of species. The document is also sent to anyone who has conducted past or current research on the plant under review, including the treatment author(s) of *The Jepson Manual* and *Flora of North America North of Mexico*. Over a period of about a month, comments are received and collated by CNPS, and a final suggested rank is sent to CNDDDB staff for discussion or concurrence.
- Final decisions on all changes are generally made with a consensus of reasoning. If there is significant disagreement about a given decision, another round of comments is solicited. In some cases, the Rare Plant Program Committee helps make a final decision where there is no consensus. The Rare Plant Program Committee, formed in 2009, is a small CNPS committee of academic experts, state agency and private industry representatives. A CNDDDB botanist also serves on this committee. One of their functions is to help make decisions on the most difficult ranking cases. Representation on the Committee is dependent upon knowledge of California floristics, conservation issues, knowledge of the CNPS Rare Plant Program and of the Status Review Process, and knowledge of the CNPS Online *Inventory of Rare and Endangered Plants*.
- The final decision is reflected in the CNPS Online *Inventory* and in the CNDDDB *Special Vascular Plants, Bryophytes, and Lichens List*.

Advantages of the CNDDDB and CNPS Cooperative Agreement

The advantages of a collaborative working relationship between a state agency program (CNDDDB) and a private non-profit organization (CNPS) to create an inventory of all the

rare plants in California are extensive. This relationship has endured for nearly half a century due to the innumerable benefits to both sides, which include:

1. California is a biodiversity hotspot and home to over 2,400 rare plants. Thus, the job of keeping their statuses current is not feasible for a single botanist, regardless of whom they work for. A collaborative relationship between the CNDDDB program and CNPS is essential for keeping rare plant data in California up to date and accurate;
2. Having a review process that is overseen and backed by two organizations ensures that any decisions made are strongly supported and stand up to scrutiny. Both the CNPS and CNDDDB program botanists strive to ensure that all rare plant decisions made are based on science and hard data; having both a State program and a non-profit organization reviewing these decisions creates a system of checks and balances so that pressure from those within any one organization does not subvert the process;
3. Cooperation on status reviews is better facilitated by utilizing the networks, as well as paper and digital resources, within both organizations (CDFW and CNPS). The CNDDDB program encourages CDFW staff and other agency personnel to actively participate in the review process, while CNPS encourages its vast network of 35 chapters throughout the state to contribute knowledge of their local flora to the review process;
4. The agreement stipulates that CNPS has access to all of the CNDDDB's rare plant data and the CNDDDB program has access to all of CNPS' rare plant data. This allows a complete set of rare plant data to be used during the status review process;

5. Data contributors only need to submit data to one place, and it is then shared among the primary organizations (CNPS and the CNDDDB program) who use the data. Ultimately, the data are also available to NatureServe, which curates Natural Heritage data at the national level.
6. The agreement between CNPS and the CNDDDB program allows both parties to discuss and set boundaries on levels of data distribution. CNPS distributes rare plant data only to the USGS 7.5' quadrangle level, and their data is publicly available. This contrasts with the CNDDDB occurrence dataset, which includes precisely mapped plant and animal locations (where possible), and distribution is restricted to CDFW staff and paid subscribers in order to protect these sensitive resources.

The Future of the CNDDDB and CNPS Working Relationship

The cooperative agreement between the CNDDDB program and CNPS is the backbone of the Rare Plant Status Review Process and is an essential component in the identification and protection of rare plant species in California. The data compiled and shared by both organizations are used throughout the environmental review process, and to inform land management decisions, guide conservation planning, and in reviewing species for possible CESA or ESA listing. Despite changes in staff, management, resources, and technology that have occurred over the past decades, the benefits of this cooperative agreement remain relevant by allowing both organizations to more efficiently use the available resources, and to provide a single streamlined process for determining the status of rare plant species in California.

Appendix A

Flow chart for processing proposed additions or status changes to the CNPS *Inventory* and CNDDDB *Special Vascular Plants, Bryophytes, and Lichens List*

1. Proposed Addition/Status Change Submitted to or Identified by CNPS. Potential additions and changes to the CNPS *Inventory* and CNDDDB *Special Vascular Plants, Bryophytes, and Lichens List* are identified by, or proposed to, the CNPS Botanist, who initiates the review process prior to listing the proposal on the Rare Plant Status Review Forum (Status Review Forum) and sending the proposal out to Regional Plant Status Review Groups (Regional Review Groups).



2. Information Query/Status Criteria Assessment. The CNPS Rare Plant Program conducts a search of all pertinent information from relevant publications, available herbarium records, available CNDDDB reports, and information from experts who have direct knowledge of the distribution, taxonomy, and biology of the proposed taxon.



3. Initial Status Review. The CNPS Rare Plant Program and the CNDDDB Botanist, with assistance of knowledgeable experts, will initiate a status review, including a proposed ranking. The CNPS Botanist will send the status review documents to Regional Review Groups and other knowledgeable botanists by means of email, and post the proposed status review on the CNPS Status Review Forum for comment. **After 3 weeks**, the CNPS Botanist will send out a “Final Call” for information extending the Status Review Forum comment period **2 additional weeks**, notifying all involved groups and previously consulted experts, and request further clarification, comments, or additional expertise including the Rare Plant Program Committee (RPPC).

If a consensus of reasoning regarding status has been reached following the “Final Call”, the comment period will be closed. The CNPS Botanist will then make a final determination in consultation with the CNDDDB Botanist⁷, and the change will be reflected in the CNPS *Inventory* and the CNDDDB *Special Vascular Plants, Bryophytes, and Lichen List*. If consensus has not been reached, proceed to step 3A.



3A. Second Status Review Period. If a consensus of reasoning is not reached during the initial review period, the CNPS Botanist shall consult with the RPPC, acquire additional supporting rationale and information, and initiate a second and final review period. **After 2 weeks**, if a consensus of reasoning regarding status has been reached, the comment period will be closed. The CNPS Botanist will make a final determination in consultation with the CNDDDB Botanist, and the change will be posted both to the *Inventory* and to the CNDDDB. If consensus still has not been reached, proceed to step 3B



3B. In-Person Meeting or Postpone Decision. If a consensus of reasoning is not reached after a second review period, and no clear evidence for a logical determination has been acquired, then the CNPS Botanist shall: (1) convene an in-person meeting, including all interested parties with relevant botanical expertise, the CNDDDB Botanist, and at least one RPPC member, in order to make a collaborative status determination based on available information, and will

⁷ If consultation between CNPS Botanist and CNDDDB Botanist leads to disagreement among the two parties in the determination, then Step 3B will be initiated.

post the change to the *Inventory*, or (2) postpone a determination until significant additional information has been acquired.

Appendix B

CNDDDB and CNPS Rarity Rankings

NatureServe Conservation Status Ranks:

The CNDDDB program assigns NatureServe Conservation Status Ranks to all species tracked in its database. All taxa tracked by the CNDDDB program are assigned both a Global Rank and a State Rank. Please see the [CNDDDB Management Framework document](#) for further explanation of Conservation Status Ranks.

Global ranks (G ranks)

Global ranks reflect the status of a species throughout its worldwide range. Global ranks are assigned at the full species level. When assessing the status of a subspecies or variety, a trinomial rank (T rank) is also assigned indicating the status of the subspecies or variety throughout its worldwide range. Below are the main categories of global ranks:

- GX- Presumed extinct
- GH- Possibly extinct; known only from historical occurrences but there is still some hope of rediscovery.
- G1- Critically imperiled; at very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
- G2- Imperiled; at high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

- G3-Vulnerable; at moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
- G4-Apparently secure; at fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
- G5-Secure; at very low risk of extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.

State ranks (S ranks)

State ranks reflect the status of a species, subspecies, or variety statewide. Below are the main categories of state ranks:

- SX- Presumed extirpated
- SH- Possibly extirpated; known only from historical occurrences but there is still some hope of rediscovery.
- S1- Critically imperiled; at very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
- S2- Imperiled; at high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
- S3-Vulnerable; at moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
- S4-Apparently secure; at a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible

cause for some concern as a result of local recent declines, threats, or other factors.

- S5-Secure; at very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.

California Rare Plant Ranks (CRPR):

CNPS maintains an additional rare plant ranking system called the California Rare Plant Ranks (CRPR). Each plant tracked by CNPS is given a rank based on rarity and then a threat code extension based on how threatened the plant is. Please see the [CNPS website](#) for additional information on CRPRs.

California Rare Plant Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere.

Plants with a California Rare Plant Rank of 1A are presumed extirpated or extinct because they have not been seen or collected in the wild in California for many years. A plant is extinct if it no longer occurs anywhere. A plant that is extirpated from California has been eliminated from California, but may still occur elsewhere in its range.

California Rare Plant Rank 1B: Plants rare, threatened, or endangered in California and elsewhere

Plants with a California Rare Plant Rank of 1B are rare throughout their range with the majority of them endemic to California. Most of the plants that are ranked 1B have declined significantly over the last century. California Rare Plant Rank 1B plants constitute the majority of taxa in the CNPS Inventory, with more than 1,000 plants assigned to this category of rarity.

California Rare Plant Rank 2A: *Plants presumed extirpated in California but common elsewhere*

Plants with a California Rare Plant Rank of 2A are presumed extirpated because they have not been observed or documented in California for many years. This list only includes plants that are presumed extirpated in California, but more common elsewhere in their range.

California Rare Plant Rank 2B: *Plants rare, threatened, or endangered in California but more common elsewhere*

Except for being common beyond the boundaries of California, plants with a California Rare Plant Rank of 2B would have been ranked 1B. With California Rare Plant Rank 2B, we recognize the importance of protecting the geographic range of widespread species. In this way we protect the diversity of our own state's flora and help maintain evolutionary processes and genetic diversity within species.

California Rare Plant Rank 3: *Review list, plants about which more information is needed*

Plants with a California Rare Plant Rank of 3 are united by one common theme – we lack the necessary information to assign them to one of the other ranks or to reject them. Nearly all of the plants constituting California Rare Plant Rank 3 are taxonomically problematic.

California Rare Plant Rank 4: *Watch list, plants of limited distribution*

Plants with a California Rare Plant Rank of 4 are of limited distribution or infrequent throughout a broader area in California, and their status should be monitored regularly.

Threat Ranks

Ranks at each level also include a threat rank (e.g., CRPR 4.3) and are determined as follows:

0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

0.3-Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)