



Staff Report – Botanical Resources and Their Consideration in Timber Harvest Documents

June 9, 2020

The treatment of botanical resources when preparing timber harvest documents has been a topic of discussion for several years, but was first formally prioritized by the Forest Practice Committee (FPC) for consideration in 2020. California Department of Fish and Wildlife's (CDFW's) Timber Botany Working Group discussed the issue of botanical resources on timberlands and their consideration in timber harvest documents in 2017. A letter on this subject was submitted to the Board in November, 2018 (appended to the 2019 letter submitted during the Annual Call for Regulatory Review; both can be found in your meeting materials). A CDFW representative also provided a presentation and engaged in discussions at the May 2019 FPC meeting in Chico. Currently, there are no provisions specifically directed toward botanical resources in the Forest Practice Rules (FPRs). Given that the Plan review process is a "functional equivalent" process, it is required that potential impacts to special status plants that are federally or state listed be analyzed pursuant to the California Environmental Quality Act (CEQA) and any identified impacts be reduced to less than significant.

There are guidance documents that have been issued by CDFW related to survey methods (2005) and by CAL FIRE related to the treatment of botanical resources during timber harvest (2009). However, the CDFW Timber Botany Working Group expressed concerns that these provisions are not necessarily implemented consistently, nor are they applied to ministerial documents.

Staff has engaged in conversations with several stakeholder groups to produce this staff report outlining some of the perceived problems surrounding the issue of botanical resource considerations in timber harvest documents. These stakeholder groups included: representatives of the California Native Plant Society (CNPS), CDFW, CAL FIRE, and the timber industry. The concerns and comments received are summarized below, with no order of priority provided.

1) Unclear Laws Result in Extended Harvest Document Approval Timelines

One issue that was raised from several interviewed stakeholders is that the process for approving timber harvest documents is often extended because the rules surrounding scoping, surveying, reporting, and mitigation for potential impacts to

botanical resources are unclear and often open to interpretation. At times this results in differing expectations depending on the individual(s) associated with the review team agencies conducting Plan review, and localized interpretation of existing laws can result in delays. Inconsistent interpretations or views amongst individuals with differing experience and backgrounds can result in differing expectations for scoping, surveying, reporting, and mitigating measures for individual Plans.

Additionally, varying interpretations of CEQA guidelines to determine which plants need to be surveyed for and mitigated for can be problematic due to the necessity to identify the threshold of “significance.” Significance can be determined, in part, based on the number of occurrences present, and an effective definition of an “occurrence” is at times not agreed upon by all parties. This is potentially problematic given that the number of occurrences of a specific plant is related to potential impacts upon a plant population. If certain interpretations result in either fewer or a greater number of “occurrences,” this can affect the “significance” of analyzed impacts and can change the necessity and scope of mitigation efforts to “avoid significant impacts” to the resource.

2) Ensuring that the appropriate plants are surveyed appropriately by a qualified individual

Which plant species should be considered during Plan preparation?

There are several categories of plant species that may be considered for scoping, and surveyeded for if necessary. These include formally listed plants under CESA or ESA, sensitive natural communities, and/or plants ranked on the CNPS Inventory of Rare Plants (IRP). There is some concern that 14 CCR § 15380 (CEQA Guideline) is often relied upon for plants species, but is not relied upon for animal species. Additional discussions and investigations are needed regarding the application of this provision as it relates to the minimization of impacts to plant species. For reference 14 CCR § 15380 can be found below:

§ 15380. Endangered, Rare or Threatened Species.

(a) “Species” as used in this section means a species or subspecies of animal or plant or a variety of plant.

(b) A species of animal or plant is:

(1) “Endangered” when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors; or

(2) “Rare” when either:

(A) Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or

- (B) The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered “threatened” as that term is used in the Federal Endangered Species Act.
- (c) A species of animal or plant shall be presumed to be endangered, rare or threatened, as it is listed in:
- (1) Sections 670.2 or 670.5, Title 14, California Code of Regulations; or
 - (2) Title 50, Code of Federal Regulations Sections 17.11 or 17.12 pursuant to the Federal Endangered Species Act as rare, threatened, or endangered.
- (d) A species not included in any listing identified in subdivision (c) shall nevertheless be considered to be endangered, rare or threatened, if the species can be shown to meet the criteria in subdivision (b).
- (e) This definition shall not include any species of the Class Insecta which is a pest whose protection under the provisions of CEQA would present an overwhelming and overriding risk to man as determined by:
- (1) The Director of Food and Agriculture with regard to economic pests; or
 - (2) The Director of Health Services with regard to health risks.

A collaborative relationship has existed between CNPS and CDFW since the 1980’s particularly as it relates to information sharing ([Rare Plant Data in California](https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=175695&inline))(<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=175695&inline>) Please also find in your meeting materials a document detailing the history of the CNPS rare plant program, titled “CNPS Rare Plant Program: Past and Present.” It was reported by several stakeholders that a Memorandum of Understanding (MOU) does exist that memorializes the CNPS and CDFW relationship, but Board staff has been unsuccessful to date in locating a copy of the MOU.

The IRP is frequently used in addition to the California Natural Diversity Database (CNDDB), CESA list, and ESA list determine what plants should be surveyed for and monitored prior to timber operations occurring under an approved Plan.

CNPS Ranking Process

The IRP is developed using an established process. First, plants are proposed by an individual (no particular affiliation is needed for someone to do this) for a status change. A list of plants proposed for status changes is maintained and plants are chosen from this list periodically for review by status review teams that are established based on regional specialty. The status review teams consider all currently available science for each plant and determine ranking status based on the available information. This includes a possible ranking for plants about which additional information is needed (Table 1).

Table 1: California Native Plant Society Inventory of Rare Plants Rankings

RANK	DESCRIPTION
1A	Plants presumed extirpated in California and either rare or extinct elsewhere
1B.1	Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California (80% of occurrences threatened)
1B.2	Plants rare, threatened, or endangered in California and elsewhere; moderately threatened in California (20-80% of occurrences threatened)
1B.3	Plants rare, threatened, or endangered in California and elsewhere; not very threatened in California (less than 20% of occurrences threatened)
2A	Plants presumed extirpated in California, but more common elsewhere
2B.1	Plants rare, threatened, or endangered in California but more common elsewhere; seriously threatened in California (80% of occurrences threatened)
2B.2	Plants rare, threatened, or endangered in California but more common elsewhere; moderately threatened in California (20-80% of occurrences threatened)
2B.3	Plants rare, threatened, or endangered in California but more common elsewhere; not very threatened in California (less than 20% of occurrences threatened)
3.1	Plants about which we need more information; seriously threatened in California (80% of occurrences threatened)
3.2	Plants about which we need more information; moderately threatened in California (20-80% of occurrences threatened)
3.3	Plants about which we need more information; not very threatened in California (less than 20% of occurrences threatened)

4.1	Plants of limited distribution; seriously threatened in California (80% of occurrences threatened)
4.2	Plants of limited distribution; moderately threatened in California (20-80% of occurrences threatened)
4.3	Plants of limited distribution; not very threatened in California (less than 20% of occurrences threatened)

Rankings are determined by numerical thresholds based on a number of categories including the number of occurrences, endemism, etc. This numerical threshold is based on the standard set forth by Nature Serve. Nature Serve is a non-profit organization that provides proprietary wildlife and plant conservation-related data, tools, and services to a variety of clients (additional information can be found on the [Nature Serve Webpage](https://www.natureserve.org/) - <https://www.natureserve.org/>). Nature Serve uses several factors and a calculator tool that they developed to determine the rarity rankings of a particular species. These factors each fall into a category and subcategory and include:

Table 2: Ranking Factors for the Nature Serve Conservation Status Assessments

FACTOR CATEGORY	FACTOR SUBCATEGORY	FACTOR
Rarity	Range/Distribution	Range Extent
Rarity	Range/Distribution	Area of Occupancy
Rarity	Abundance/Condition	Population Size
Rarity	Abundance/Condition	Number of Occurrences
Rarity	Abundance/Condition	Number of Occurrences or Percent Area with Good Viability/Ecological Integrity
Rarity	Abundance/Condition	Environmental Specificity

Threats	Threats	Overall Threat Impact
Threats	Threats	Intrinsic Vulnerability
Trends	Trends	Long-term Trends
Trends	Trends	Short-term Trends

Not all of these characteristics are always used during the ranking process. This is because their system uses several “core” factors as well as several “conditional” factors. The conditional factors are often used if inadequate information is available for the core factors. The two conditional factors are: Environmental Specificity and Intrinsic Vulnerability. Additional characteristics may be considered where appropriate, including the number of protected or managed occurrences, rescue effect, and comparisons to other global or national/subnational rankings. A minimum of one factor from each Rarity subcategory or one factor from the Rarity category and one factor from either the Threats or Trends category are required for a ranking to occur. Additional information can be found in their “[NatureServe Conservation Status Assessments: Methodology for Assigning Ranks](https://www.natureserve.org/sites/default/files/publications/files/natureserveconservationstatusmethodology_jun12_0.pdf)” document (https://www.natureserve.org/sites/default/files/publications/files/natureserveconservationstatusmethodology_jun12_0.pdf). California deviates slightly from their ranking process in that they use a shorter distance between individual occurrences (0.25 miles or greater rather than 0.6 miles), which can result in fewer ranked plants or varied ranking status. The number of occurrences considered under this process are obtained from CNDDDB and each occurrence is “graded” by CNDDDB based on how old the occurrence is, who submitted the occurrence, and what their credentials are. These grades are considered in the ranking process. If consensus cannot be reached by the regional status review team, the plant will be considered by a panel of experts.

There is some concern expressed with using the IRP for scoping plants because some plants may not have enough information to reflect their true status. This resulted in part in questions related to which ranks truly warrant surveys and mitigation measures, particularly for rank 3 plants which are lacking in population data. Because plants may need to be surveyed at particular times of the year in order to detect them and properly identify them (often coinciding with blooming periods), having to survey large numbers of plants can quickly result in a large time commitment and costs for landowners.

Appropriate Surveys

Several stakeholders were concerned about the timing of surveys and ensuring that they occur at appropriate times and under appropriate conditions. These stakeholders believe that the bulk of the Plan area should be surveyed using

established protocols to maximize detections and adequately characterize the number of species and occurrences that are present. It was stated that such surveys may be necessary for impacts to be analyzed and for mitigations or avoidance to be implemented. Another related comment expressed concern over this issue of survey life, or how long should a survey be valid prior to engaging in additional survey efforts. One commenter indicated that in some cases, especially on industrial lands, or lands covered by an NTMP, that there have been upwards of 20 years of survey data collected, which could be relied upon to hone in the number of species surveyed for, or negate the need for ongoing survey efforts within these landscapes. It was discussed that in certain instances, reliance upon existing survey data, if robust, may be appropriate for future management activities.

Qualified Surveyors

Comments were received that, at times, there have been questions about the quality of surveys and who is qualified to perform botanical surveys for the purposes of preparing a Plan. Based on information received, this appears to be a narrow problem, and many stakeholders indicated that survey quality was sufficient, and qualifications of surveyors did not appear to be a consistent problem.

3) Should the CNPS Process for Rankings Be More Public?

Some stakeholders expressed concern that the current process for CNPS ranking and ranking review is not as transparent as it could be. There were concerns expressed that engagement from the public throughout the ranking process is not made available and therefore public input is not considered during discussion of species rankings. One stakeholder suggested that the ranking process should include a white paper describing the precise methods and individual decision points for each ranking decision that is available to the public.

4) General review of past CNPS Rankings

Board staff did receive comments from certain stakeholders that many of the CNPS ranked species have been ranked for a significant amount of time without review of their ranking status. Some stakeholders commented that a general review of past rankings should occur to update the rankings. Concerns over the timeliness of review led to a discussion of a particular plant species called the Scott Mountain's Fawn Lily (*Erythronium citrinum* var. *roderickii*). Significant survey data was collected in order to support a revision in ranking status for this particular plant and the following are the timing and individual steps that occurred in the lifecycle of this particular ranking:

- 1994: *Erythronium citrinum* var. *roderickii* was added to rank 1B (rare, threatened, or endangered in California and elsewhere) of the 5th edition of the CNPS Inventory (printed volume)

- 10/4/2012: *Erythronium citrinum var. roderickii* was proposed for rank change from 1B to 4, but did not meet the requirements for downranking at the time. Its occurrences and status was periodically reviewed by CNPS rare plant staff to determine if/when downrank was warranted since this time.
- 1/11/2017: Internal review by CNPS rare plant staff determined it met the general criteria for downranking and drafted status review proposal with CNDDDB. Proposal to downrank to rank 4 was sent to Northwest Review Group and forum on January 11, 2017.
- 2/3/2017: Final call for information regarding rank change was sent, with notification of delay in decision to change based on disagreement. In-person meeting to discuss status set for 3/22/2017.
- 3/22/2017: In person meeting held in Redding to discuss status (15 people in attendance from Shasta-Trinity NF, SPI, CNPS, BLM, CDFW). Presentations provided by SPI and CDFW. Still no consensus reached. Additional research needed.
- 4/5/2017: In person meeting summary sent with proposal/request for development of monitoring plan based on no consensus.
- 11/3/2017: Notification from SPI regarding their development of a proposed general management strategy where plants are present on SPI lands.
- 2/5/2019: Draft SPI management plan sent to CNPS, scheduled in person meeting for 3/19 to discuss
- 3/19/2019: In person meeting with SPI, CDFW, CNPS to review draft management plan.
- 4/18/2019: Final SPI monitoring plan for *E. citrinum var. roderickii* submitted to CNPS.
- 4/22/2019: Changed status of *E. citrinum var. roderickii* from 1B.3 to 4.3 in CNPS Inventory and CNDDDB.
- 5/8/2019: CNPS field/site visits with SPI to view monitoring plots for *Erythronium*.

While this provided timeline may not be indicative of all plant rankings, this species of particular concern was associated with “timberland” within Northern California.

5) Should Sensitive Natural Communities Be Considered?

Some stakeholders have expressed concerns about the use of Sensitive Natural Communities managed through the CDFW VegCAMP Program ([VEGCAMP Webpage](#)). While the program has been around since the mid 1990’s and the data is continuously being updated, a portion of the state is not mapped to current standards. Some stakeholders have shared experiences with this system where more common communities have been considered “rare”. One stakeholder expressed that the classification system for sensitive natural communities may not be well designed to crosswalk into a regulatory framework and that the process for utilizing this system to aid in plant conservation needs to be more clearly defined including evaluation methods and metrics for success.

6) Should Survey Requirements Apply to Ministerial Documents?

Several groups discussed the potential impacts of timber harvest on botanical resources and how they relate to ministerial timber harvest documents (Exemptions and Emergency Notices). Some stakeholders stated that ministerial documents should not have significant adverse environmental impacts and that if botanical resources are not considered during the plan preparation process, potentially significant impacts may be occurring that are generally unknown.

7) The Effectiveness of Current Management has not Been Assessed

Little work has been done to interpret whether the current measures taken to protect botanical resources are effective. Several parties commented that a “check-in” to analyze available data and the process of managing botanical resources that has matured over the last 20 years would be useful to facilitate active management, while still addressing conservation of plant species.

CNDDB Reporting of Occurrences

Some stakeholders addressed the issue of plan submitters being required to submit their survey data to CNDDB for future analysis and feedback for the CNPS ranking review process. As discussed previously, the number of occurrences and “grade” of those occurrences, which includes how recent they are, are important components when determining the ranking for a given species. As such, encouraging reporting of survey data to the CNDDB may be useful in the review of past rankings as well as the initial consideration of new rankings. However, some concern was expressed by certain stakeholders that this database is a positive detection only database and that negative detections are also important and can play a critical role in ranking reviews.

Conclusion

This staff report is intended to provide information captured from various stakeholder groups that may be affected by Board action as it relates to management of botanical resources during the Plan preparation, approval, and implementation and timber operations. Appended to this staff report are several other documents that provided supporting data as it relates to botanical species and the Plan process. Board staff has not yet developed any current strategies or recommendations on actions that the Board may consider to address this specific issue, but would recommend that additional comments be solicited by stakeholders in future committee or workshops to allow the Board to identify a problem statement to support potential Board actions.

APPENDICES

1. Annual Call for Regulatory Review Comment by CDFW
2. CAL FIRE Botanical Resources Memo, 2009
3. Freemontia Article – “CNPS Rare Plant Program: Past and Present”
4. CDFW Botanical Resource Guidelines for Timber Harvest, 2005



November 22, 2019

Mr. Matt Dias, Executive Officer
California Board of Forestry and Fire Protection
1416 Ninth Street
PO Box 944246
Sacramento, CA 94244-2460

Board of Forestry and Fire Protection 2019 Regulations and Priority Review

Dear Mr. Dias:

California Department of Fish and Wildlife (CDFW) staff has considered potential changes to the California Forest Practice Rules (Cal. Code Regs., tit. 14 § 895.1 et seq.) in response to the Board of Forestry and Fire Protection (Board) announcement, *Board of Forestry and Fire Protection 2019 Regulations and Priority Review*, dated September 30, 2019. As the Board discusses its priorities and potential regulatory changes, CDFW recommends (1) retaining northern spotted owl Forest Practice Rules review as a Priority 1 topic, (2) revisiting and formally prioritizing the inclusion of botany-specific language in the Forest Practice Rules, and (3) reviewing and revising Forest Practice Rules pertaining to Board Sensitive Species and associated buffer zones and critical periods.

(1) Northern Spotted Owl

CDFW requests that the Board's Forest Practice Committee retain "Review of Forest Practice Northern Spotted Owl Rules" as a Priority 1 topic for 2020. The Board initially prioritized this item after CDFW's first request in 2017. Since then, the Board has facilitated numerous discussions and heard testimony from stakeholders, as detailed in the Board's 2018 Annual Report. However, the Board's Forest Practice Committee has not identified a problem statement due, in part, to numerous parallel activities surrounding northern spotted owl management. CDFW believes that recent developments may inform the Board's approach to developing a problem statement and ultimately reviewing the northern spotted owl rules:

- CDFW facilitates an executive level group including the U.S. Fish and Wildlife Service (USFWS), California Department of Forestry and Fire Protection (CAL FIRE), and Board staff to enhance interagency coordination of northern spotted owl conservation and management topics.
- Landowner concerns have been heard, and are being examined and addressed at various levels: CDFW staff are available for consultations and

pre-consultations; the USFWS is revising its “no take” guidance documents (Attachments A and B) to specify flexibility under certain scenarios; CAL FIRE is leading an effort to develop a programmatic Spotted Owl Resource Plan for portions of northeastern California; and the USFWS has established a working group to produce a Programmatic Safe Harbor Agreement for northern spotted owl.

- CDFW released the Spotted Owl Observations Database Management Framework¹ to address recurring questions related to the Spotted Owl Observations Database processes. This public document increases transparency and provides clarity about CDFW’s spotted owl data, especially for abandonment and invalidation of northern spotted owl activity centers. Additionally, CDFW presented an overview of this framework to the Board in April 2019 and continues to make outreach efforts to stakeholders emphasizing the importance of providing high quality spotted owl data to the database manager and to CDFW review team staff during timber harvest plan review.
- The barred owl threat to northern spotted owls continues to be a top concern and priority. By facilitating the Barred Owl Science Team (BOST) CDFW and our partners support northern spotted owl conservation and recovery by providing scientific review and recommendations regarding the threat of barred owl to resource management agencies.

CDFW looks forward to working with the Board to construct a formal problem statement and begin to review and update the Forest Practice Rules for northern spotted owl.

(2) Botany Regulations

CDFW requests that the Board prioritize strengthening the Forest Practice Rules to include specific rules for botanical resources. CDFW initially made this request to the Board in November 2018 that was further supported by a related presentation at the May 2019 Board meeting in Chico.

The Forest Practice Rules contain no botany-specific regulations. Instead, the timber harvesting process relies on guidance documents written by CDFW and CAL FIRE to fill in the regulatory gaps. The omission of scoping, mitigation, and management practices for botanical resources creates regulatory uncertainty and results in avoidable impacts to these resources. Augmenting the Forest Practice Rules will provide clear direction to applicants prior to plan submittal, reduce plan review time, and lead to more flexible management strategies for these resources.

¹ Spotted Owl Observations Database Management Framework is posted online:
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=166159&inline>

CDFW is ready to collaborate with the Board and stakeholders to develop rules for the disclosure and protection of California's botanical resources.

(3) Buffer Zones for Sensitive Species

CDFW requests that the Board revisit the rules that protect the nests of sensitive species found in Forest Practice Rules Section 919.3 [939.3, 959.3]. This section contains rules governing nest buffers and critical periods for all Board of Forestry Sensitive Species found in Forest Practice Rules Section 895.1, except for California condor, great gray owl, northern spotted owl, and marbled murrelet. While northern spotted owl and marbled murrelet are addressed in their own Forest Practice Rule sections, great gray owl and California condor are only mentioned in Forest Practice Rules Section 895.1. Identifying nest buffers and critical periods for these Board of Forestry Sensitive Species in Forest Practice Rules Section 919.3 will not only improve consistency of the Forest Practice Rules, but will improve the timber harvesting process and allow for greater conservation of imperiled forest species.

Additionally, CDFW believes that the list of Board of Forestry Sensitive Species found in Forest Practice Rules Section 895.1 would benefit from several additions, including from guilds other than birds. Denning mammalian species, such as marten and fisher, would be a logical choice for inclusion, as buffers to mammalian den sites are largely analogous to buffers to avian nest sites. Many mammals have long periods of adherence to natal den sites and den sites may be reused in future years—similar to nesting bird behavior.

CDFW is interested in augmenting the list of Board of Forestry Sensitive Species and working with the Board and stakeholders to develop clear language that will benefit California's sensitive species and timberland owners.

Mr. Matt Dias, Executive Officer
California Board of Forestry and Fire Protection
November 22, 2019
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Conclusion

The topics outlined above will increase the efficiency, effectiveness, and transparency of the timber harvesting review process. CDFW seeks to work collaboratively with the Board, CAL FIRE, and stakeholders to promote regulatory changes and solutions that provide clarity to the Forest Practice Rules, increase resource protection, and improve regulatory certainty for project proponents. Thank you for considering CDFW's requests. If you have any questions about the topics included in this letter, please contact Isabel Baer at (916) 651-3110 or isabel.baer@wildlife.ca.gov. CDFW looks forward to working with the Board and its staff.

Sincerely,



Richard Macedo, Branch Chief
Habitat Conservation Planning Branch

Attachment

cc: J. Keith Gillless, Ph.D, Chair
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EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



November 15, 2018

Mr. Matt Dias, Executive Officer
California Board of Forestry and Fire Protection
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Dear ^{Matt} Mr. Dias:

2018 PRIORITIZATION OF FOREST PRACTICE RULE UPDATES FOR BOTANICAL RESOURCES

The California Department of Fish and Wildlife (CDFW) requests that the California Board of Forestry and Fire Protection (Board) consider reviewing the California Forest Practice Rules (Cal. Code Regs., tit. 14, § 895.1 et seq.) to augment the rules for evaluating impacts to botanical resources related to timber harvesting. In recognition of the botanical questions that routinely arise during the timber harvesting review process, CDFW convened an internal working group in early 2017 to review the Forest Practice Rules related to botanical resources and the management of botanical resources on private timberlands. The outcome of this working group is CDFW's recommendation to augment the Forest Practice Rules for botanical resources to make the timber harvesting review process more effective and efficient.

Clear direction in the Forest Practice Rules will increase the likelihood that potentially significant impacts to botanical resources will be addressed by applicants prior to timber harvesting plan (plan) submittal, and reduce the time and effort necessary to complete plan review. A significant proportion of CDFW's review effort is dedicated to identifying potential impacts to botanical resource issues, and comments often recommend routine scoping, surveying, or protection. Appendix 3 illustrates some of the potentially significant, adverse impacts that may occur during timber harvesting operations. Many of these impacts could be reduced to a level below significant through routine best management practices implemented during plan preparation and implementation. Augmenting the Forest Practice Rules specific to botanical resources would minimize impacts and increase efficiency for agency and stakeholder plan participants.

More thorough plan disclosure of botanical resources via the Forest Practice Rules has the added benefit of leading to more flexible, effective management strategies for these resources. Thorough documentation of botanical resources, including species' locations and monitoring of known populations, will contribute to a better understanding of how botanical resources respond to timber harvesting. Such information would allow CDFW and stakeholders to focus review and management efforts on a smaller subset of species needing specific protection, resulting in more defensible and effective

management practices over time.

Background and Need

California has more plant species than any other state in the nation (approximately 6,500 native species), and more than one-third of these are found nowhere else in the world (CNPS 2018). However, 284 species, subspecies, and varieties of native plants are designated as rare, candidate, threatened, or endangered by state or federal law (CDFW 2018a), and over 2,000 more plant taxa are considered to be of conservation concern (CDFW 2018b). According to California Natural Diversity Database (CNDDDB) spatial records, approximately 12,904 special-status plant occurrences have been documented in forested ecosystems (see Appendix 1). There is also a high diversity of plant communities in California, in which 53 percent are considered potentially sensitive (1,347 out of 2,555 plant associations are designated a State Rank of 1-3) (CDFW 2018c).

California law related to timber harvesting establishes the Legislature's intent in the Forest Practice Act that timber harvesting be conducted via "an effective and comprehensive system of regulation" while protecting natural resources (Pub. Resources Code, §§ 4512 & 4513). Likewise, the Forest Practice Rules state "the goal of forest management on a specific ownership shall be the production or maintenance of forests which are healthy and naturally diverse, with a mixture of trees and under-story plants..." (Cal. Code Regs., tit. 14, § 897, subd. (b)(1)). In 2012, Assembly Bill (AB) 1492 passed with direction from the California Legislature to identify areas to improve efficiencies and protect natural resources during the timber harvesting review process (Pub. Resources Code, § 4629.2).

Agencies and land managers have tried to address gaps in the current Forest Practice Rules related to botanical resources through development of guidance documents. In 2005 CDFW developed timber-specific botanical survey guidelines (CDFW 2005) to address many of the common botanical issues that arise during reviews and inspections. A 2009 memorandum issued by the California Department of Forestry and Fire Protection (CAL FIRE 2009), describes practices to address "special-status plants" (rare, threatened or endangered listed species, or species that meet the criteria of California Environmental Quality Act (CEQA) Guidelines §15380(d)) during the scoping process for timber harvesting plans. Landowners address botanical resources through various mechanisms, such as project-specific surveys and protection measures, and may also implement property-wide management plans or agreements.

Botanical scoping and survey processes, and the application of protection measures to avoid significant adverse impacts to botanical resources have been employed inconsistently in timber harvesting plans. In 2016, 44 percent and in 2017, 37 percent of first review comments from CDFW's Region 1 Interior Timberland Conservation Program, were specific to eliciting information about botanical resources missing from

applicants' plans. Commonly addressed topics are shown in Appendix 2.

It is unclear whether botanical resources are being adequately addressed during plan review process and if plan-specific protection measures are effective. Because the Forest Practice Rules do not contain disclosure and protection standards specific to botanical resources, protection measures have been applied inconsistently. Further, landscape-level data for plant populations and plants' responses to timber harvesting is either not collected or is inefficiently used to guide management recommendations. As submitted to CAL FIRE, plan-specific botanical protection measures often employ a one-size-fits-all approach, which may not reflect the diversity of California's native plants and plant communities and their varied responses to timber harvesting.

Healthy plant communities are heterogeneous and resilient environments, adapted to dynamic ecological conditions. In recognition of changing landscape conditions associated with timber harvesting, as well as with other factors such as climate change and severe fires, botanical best management practices need to evolve. While there will always be a need for botanical surveys (i.e. when new species are described, to determine if plants have colonized unoccupied habitat, or when projects are proposed in areas that have never been surveyed) many timberland owners have already expended considerable effort to locate botanical resources on their properties. Having years of botanical surveys on many areas of private timberlands available can allow for a shift in resources towards the active management of botanical resources. Active management practices, compared to common hands-off approaches will benefit the plants while also allowing flexibility in conducting timber operations. CDFW suggests the Board develop a framework for botanical surveys, and shift the focus of botanical resource protection from comprehensive inventorying and avoidance of species, to targeted studies and active management.

Conclusion

California has many unique and rare botanical resources that are in need of protection and management. However, the current Forest Practice Rules' omission of scoping, mitigation, and management practices for botanical resources creates uncertainty and results in avoidable impacts to these resources. Augmenting the Forest Practice Rules to recommend routine scoping, surveying, and protection of botanical resources will provide clear direction to applicants prior to plan submittal, reduce the time and effort necessary for CDFW and other review team agency staff to complete plan review, and lead to more flexible, effective management strategies for these resources.

CDFW asks that the Board consider this request to prioritize the evaluation of existing Forest Practice Rules pertaining to botanical resources during the 2019 rule-making session. CDFW has been working to evaluate botanical regulatory changes for several months and would welcome the opportunity to discuss our findings with the Board. CDFW is committed to working with the Board and stakeholders to develop efficient and

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effective botanical rules.

Please see the CDFW Native Plant Program website at:
<http://wildlife.ca.gov/Conservation/Plants> for more information on rare plant biology,
laws, and best management practices. Additional information specific to timber
harvesting review is provided at: <http://wildlife.ca.gov/conservation/timber>.

If you have questions about this letter or would like further information, please contact
Ms. Isabel Baer, Timberland Conservation and Native Plant Program Manager, at
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Sincerely,



Richard Macedo, Branch Chief
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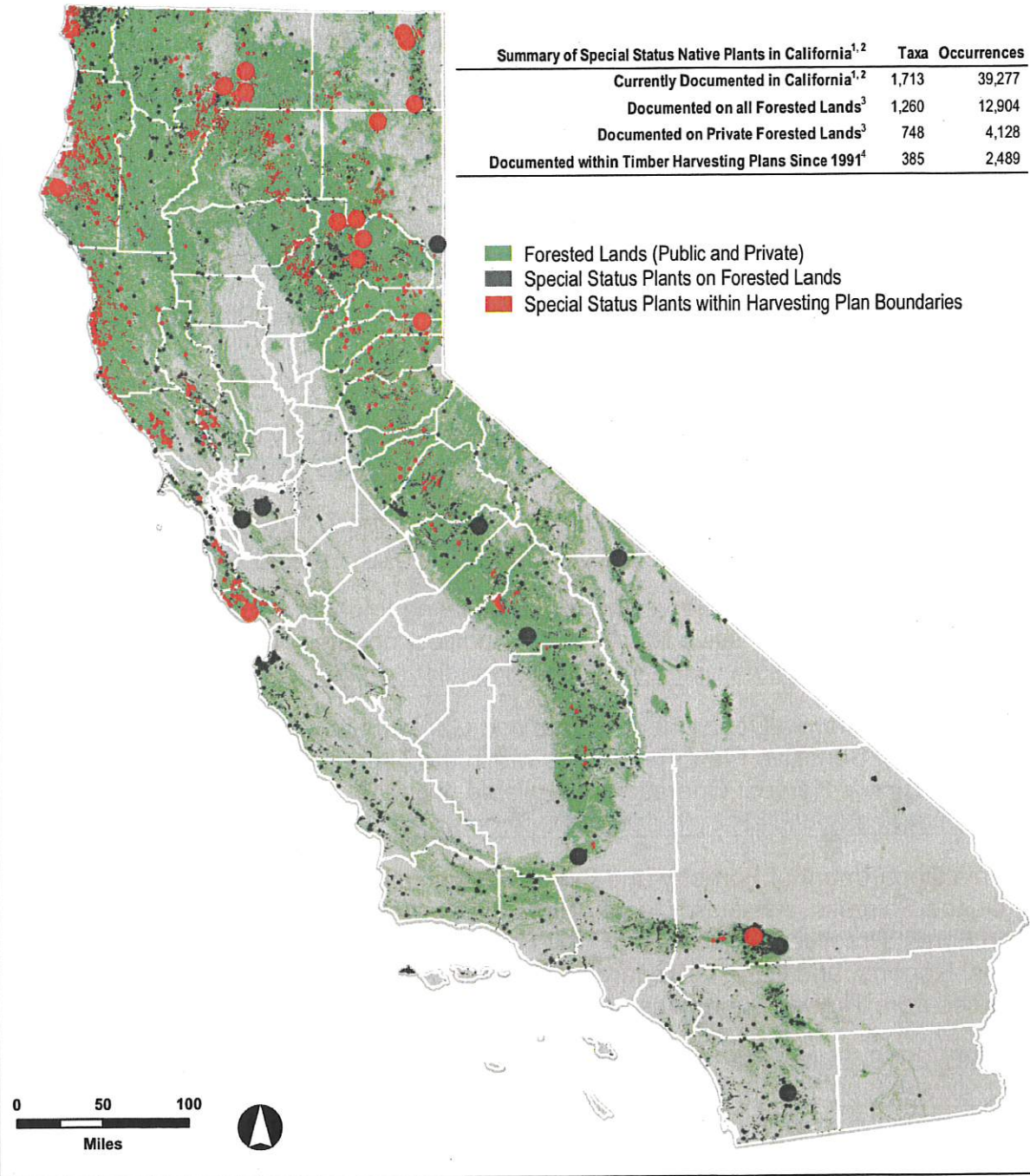
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Appendix 1. Special Status Native Plants Documented on Forested Lands in California 1, 2



- 1) Data derived from the California Natural Diversity Database (CNDDDB), accessed 6/29/2018 (CDFW, 2018d). The CNDDDB is a presence-only database, no inference can be made regarding lands that have never been surveyed. For more information regarding the CNDDDB see Bittman's article in Fremontia (2001).
- 2) Special Status Plants in this map include plants listed or proposed for listing under the Federal Endangered Species Act (ESA), the California Endangered Species Act (CESA), the Native Plant Protection Act (NPPA) and/or California Rare Plant Rank (CRPR) Rank 1 and 2. See CDFW's 2018 protocols for more in-depth description of "Special Status Plants" (CDFW, 2018d).
- 3) Data are approximate, private forested lands derived from subtracting public lands (BLM, 2018) from forested lands (USGS, 2016).

Appendix 2. Topics Commonly Addressed by CDFW During Plan Review for Botanical Resources	
Botanical report general	<ul style="list-style-type: none"> • Missing prior consultation information or incorrect information provided • Report mistakenly truncated
Scoping	<ul style="list-style-type: none"> • Entirely missing from plan • Coverage inadequate and missing plants (a minimum 9-quad search is recommended; however, plants other than those captured in the 9-quad search may have potential to occur in the plan area) • Suitable habitat disclosure inadequate/rationale inaccurate • Sensitive natural communities not addressed • Includes incorrect species' names and/or rankings • Missing, or unclear • Not conducted to most current CDFW protocol level, or of equivalent quality • Spatial coverage omissions, e.g., proposed roads, harvest units, and or high potential habitat omitted, meadow restoration • Density too sparse throughout habitats • Timing inadequate • Sensitive natural communities likely present and need further assessment and disclosure • Resulting survey plant list includes incorrect species' names and/or rankings
Sensitive species	<ul style="list-style-type: none"> • CEQA Guidelines §15380 species inadequately addressed vs. Federal and State listed species • Disclosure of California Rare Plant Rank (CRPR) 3s and 4s lacking
Positive findings	<ul style="list-style-type: none"> • Disclosure details inadequate/missing - CNDDDB form (or equivalent population data) submission required to CDFW per CEQA (Pub. Resources Code § 21003 subd. (e)). • Mitigation measures inadequate/unclear, CDFW suggests consultation to help address this • Adequate defaults needed for future surveys or if additional rare plants found during future operations, until consultation with CDFW occurs • Sensitive natural communities mitigation measures inadequate, CDFW suggests consultation to help address this • Maps of positive findings inadequate or unclear • Maps with positive findings missing or not included in Section II

Noxious weeds	<ul style="list-style-type: none"> • Present and need to be addressed to assess potential significant adverse impacts
Plan other	<ul style="list-style-type: none"> • General disclosure inadequate, what operations will occur on non-timbered habitat, CDFW cannot assess risk to plants • General format issues, discrepancies between botany in different sections (I - V) of the plan
Cumulative impacts	<ul style="list-style-type: none"> • Herbicide cumulative impacts and/or other concerns • Revise plan to include impacts to botanical resources in Section IV
NTMP	<ul style="list-style-type: none"> • Section II need provision or clarification for subsequent NTMP scoping/survey updates in Section II
Reports not submitted with plan	<ul style="list-style-type: none"> • Missing specification that report will be amended into the plan appropriately • - Missing specification that botanical report will be submitted to CDFW, a sufficient number of days prior to operations to allow agency review of the botanical report or as soon as complete • Missing language specifying CNDDDB forms (or equivalent population data) will be submitted to CDFW per CEQA [Pub. Resources Code §21003 subd. (e)]. • NTMP missing provision for subsequent NTMP scoping/survey updates in Section II • Clarification needed that botanical reports are required for negative surveys

Appendix 3. Examples of Adverse Impacts of Timber Operations on Special-Status Plants	
Timber Operation	Impact
Road/ landing/ crossing construction	Crushing with equipment → direct mortality or injury Permanent or temporary loss of habitat
Timber felling	Crushing with equipment or felled trees, or trampling → direct mortality or injury
Tractor yarding	Crushing with equipment → direct mortality or injury Soil disturbance → creates conditions favorable to weeds Soil compaction → physiological stress ^a ; creates conditions favorable to weeds
Tree removal ^b	Reduced shade → physiological stress Vegetation community changes → loss of host species for special-status parasitic plants Vegetation structural changes → increased mammalian herbivory; modification of fire frequency and intensity Decreased relative humidity → physiological stress
Use of logging roads	Dust → reduced photosynthesis, reduced pollination
Water drafting	Reduced water availability → physiological stress
Herbicide application	Direct mortality or injury
Pile burning	Direct mortality or injury
Soil ripping	Direct mortality or injury
Replanting	Eventual excess shade if tree density increased → physiological stress
Construction spoils disposal	Plants buried → direct mortality or injury Introduction of weed seeds
Rock quarry	Permanent or temporary loss of habitat Dust → reduced photosynthesis, reduced pollination
Notes:	
a. Physiological stress can lead to plant mortality.	
b. Some environmental changes, such as tree canopy removal, may be beneficial to some species in some circumstances.	

Memorandum

To: Sacramento and Region Forest Practice Managers and Unit Foresters **Date:** August 6, 2009

Telephone: (530) 224-2461

Website: www.fire.ca.gov

From: Duane Shintaku
Assistant Deputy Director, Forest Practice
Department of Forestry and Fire Protection

Subject: Environmental Review of Plans, Reports, and Permits Regarding Potential Adverse Impacts to Botanical Resources from Timber Operations

An important part of the California Department of Forestry and Fire Protection's (CAL FIRE) Lead Agency role in the environmental review and approval of timber harvesting operations¹ is the consideration of potential significant adverse impacts to botanical resources. The Department of Fish and Game (DFG) provides comments to CAL FIRE in its role as a Review Team Member or as a Responsible Agency regarding "special plants"², including formally listed rare, threatened or endangered species³ and non-listed species which meet the criteria of California Environmental Quality Act (CEQA) guidelines 14 CCR § 15380(d)⁴. The guidance below and attached flowchart is directed toward review team staff and forest practice inspectors in their consideration of potential impacts to botanical resources arising from timber operations.

REVIEW TEAM CONSIDERATIONS FOR BOTANICAL RESOURCES

- Registered Professional Foresters (RPFs) are encouraged to follow the scoping disclosure and mitigation guidance described in the 1999 memo entitled: *CDF Guidelines for Species Surveys, Avoidance of Significant Impacts and Identified Mitigations*. RPFs need to conduct adequate scoping prior to plan submittal and provide sufficient disclosure of the presence of individuals or habitat of state or federally listed plants or California Native Plant Society listed species in categories 1a, 1b, or 2 that might be significantly impacted by the proposed operations.
- CAL FIRE will evaluate the sufficiency of information and the proposed protection measures specified in the plan. As necessary, CAL FIRE will require the RPF to provide available site specific information related to the species abundance, distribution, reproductive cycle, quality and quantity of habitat, and present/historic range, including any site specific observations and data collected by the landowner that may not be available to the review team.

- If CAL FIRE records, review team agency reports or public letters raise a fair argument supported by substantial evidence⁵ that a significant adverse impact or cumulative impact may occur from proposed timber operations, CAL FIRE will evaluate the issues raised in the fair argument and will ensure that those issues have been addressed, as appropriate based upon the listing status of the plant species in question.
- For those species which are listed as threatened, endangered (under the California Endangered Species Act (CESA) or the Endangered Species Act (ESA)) or rare under the Native Plant Protection Act (NPPA)⁶, CAL FIRE will limit its consideration of the species' population status to within California in its evaluation of significant adverse impacts and/or cumulative impacts. The frequency and distribution of a listed plant species beyond the California border will not be a factor when determining the significance of impacts or in the development of take avoidance strategies as consistent with ESA and CESA. Evaluation and application of ESA and CESA take prohibitions will only be applied to lands within the State⁷. Removal of plants listed as rare under NPPA may occur in accordance with Fish and Game Code §1913 where a significant effect will not occur.
- For those plant species which are not listed under ESA, CESA or NPPA their distribution throughout all or a significant portion of its range may be considered when determining whether or not potentially significant impacts will arise under CEQA Guidelines §15380 (d) (i.e. a plant is "considered" rare, threatened or endangered). Mitigation for unlisted plants shall be designed to prevent a significant reduction of the known distribution and range and should be directed at preventing extirpation of a plant population from a known location. This is particularly applicable in those instances where a plant is found to exist in very small numbers or in isolated groupings within California, but also known to exist outside of California.
- The requirement for botanical survey(s) should be based upon the lack of sufficient information and knowledge regarding the plant's location or habitat requirements, to allow the review team to make an informed decision on the potential for significant or cumulative impacts. If timber operations are planned in a manner which clearly avoids potential impacts (e.g. via altering the timing and location of operations), then it is likely that surveys will not be needed. The Plan record should include: specific information on plant biology and habitat requirements (soils, aspect, elevation, moisture, micro-climate, shade tolerance, sensitivity to site disturbance), the results of previous plant surveys, pertinent bibliographic citations, and descriptions of all individuals, organizations and plant records used in Plan preparation.

- CAL FIRE shall review all requests by DFG for surveys for the purpose of determining the presence or absence of sensitive botanical resources. CAL FIRE, as lead agency, may conclude that surveys are unnecessary to avoid/mitigate significant adverse impacts. In lieu of surveys, CAL FIRE may require other measures that ensure avoidance, subject to constraints of plant phenology including, but not limited to: (1) on-site training for the Licensed Timber Operator (LTO) and inclusion of photographs and plant habitat description(s) in the approved Plan; (2) "walk-through survey(s)" by the RPF or qualified botanist prior to commencement of operations; (3) project specific mitigation to avoid unnecessary damage if the plant is discovered in the area during timber operations; and (4) effectiveness monitoring.
- In making a decision to approve or disapprove timber operations CAL FIRE should examine the whole record (e.g. Timber Harvest Plan (THP) and supporting literature, agency reports, and public comment) in determining the sufficiency of disclosure and the effectiveness of the proposed protection measures to avoid significant impacts or take to comply with CEQA, NPPA, CESA and ESA.
- Where a THP implements, in part, a project approved by another lead agency (typically conversions to alternate or non-timber growing use), the THP should reference and rely upon the mitigation measures identified for reducing impacts to botanical resources found in the CEQA document adopted or certified by the lead agency (CCR §15096 (f)). If the CEQA document does not contain mitigations for botanical resources, or the mitigations are not sufficient in reducing impacts to a level of less than significant, CAL FIRE should: 1) request the submitter to provide additional information and require mitigation, as above (CCR §15096 (g)(2)); or, 2) where mitigations and/or avoidance measures required in the THP would result in changes to the project approved by the lead agency, request that the lead agency prepare a subsequent or supplemental CEQA document that addresses impacts that are new or not recognized, or mitigations that were found to be infeasible at the time of the lead agency's approval of the project (CCR §§ 15162 and 15163).
- Where the Director has certified a Program Timberland Environmental Impact Report (PTEIR) in conformance with CCR §1092.02, all Program Timber Harvesting Plan(s) (PTHP(s)) shall rely upon the measures found in the PTEIR for protecting botanical resources as referenced in the checklist that accompanies each PTHP (CCR §1092.01(c)). DFG shall review PTHPs in accordance with CCR §1092.18 and ensure its consistency with the PTEIR's provisions to mitigated impacts to botanical resources. Where the PTHP is found by the Director to be within the scope of the analysis in the certified PTEIR, the PTHP shall be approved. Where the PTHP is outside the scope of analysis in

- the PTEIR for protection of botanical resources the submitter may alternatively rely upon the guidance in CCR §1092.01(d).
- In addition to the CDF Guidelines for species surveys, RPFs are also encouraged to be familiar with the following information sources:

California Department of Fish and Game, Natural Diversity Database. July 2009. Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication. 71 pp.

California Department of Fish and Game. 2005. Guidelines for conservation of sensitive native plant resources within the timber harvest review process and during timber harvest operations.

http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/THP_BotanicalGuidelines_July2005.pdf

Attachment: "Evaluation Process for Botanical Resources" (8-6-2009 Flowchart)

Footnotes:

¹ CAL FIRE reviews and approves timber harvesting operations proposed in Timber Harvesting Plans (THPs), Nonindustrial Timber Management Plans (NTMPs), Program THPs (PTHPs) tiering to certified Program Timberland Environmental Impact Reports (PTEIRs) and Timberland Conversion Permit applications.

² "Special Plants" refers to all plant taxa inventoried by DFG's Natural Diversity Database (CNDDB), regardless of their legal or protection status, including: federally or state listed rare, threatened or endangered species or candidates for listing; those that fall under CEQA § 15380 (d); California Native Plant Society listed species, 1a, 1b, 2 and some 3; populations threatened with extirpation in California but present elsewhere; and, plants associated with habitats that are declining in California at a significant rate (e.g. wetlands, riparian, vernal pools, old growth forests, desert aquatic systems, native grasslands, valley shrub land habitats, etc.).

³ Scientific and common names for State-listed plants are listed in Title 14, § 670.2. A federal listing of endangered and threatened animal and plant species is provided in the Code of Federal Regulations (see 50 C.F.R. §§ 17.11–.12).

⁴ CEQA Guidelines § 15380 (d) defines Endangered, Rare or Threatened Species to include "A species not included in any listing identified in subdivision (c) [state or federally listed] shall nevertheless be considered to be endangered, rare or threatened, if the species can be shown to meet the criteria in subdivision (b) [criteria for rare and endangered]. The Department must evaluate potential significant impacts to plants meeting § 15380 (d) criteria.

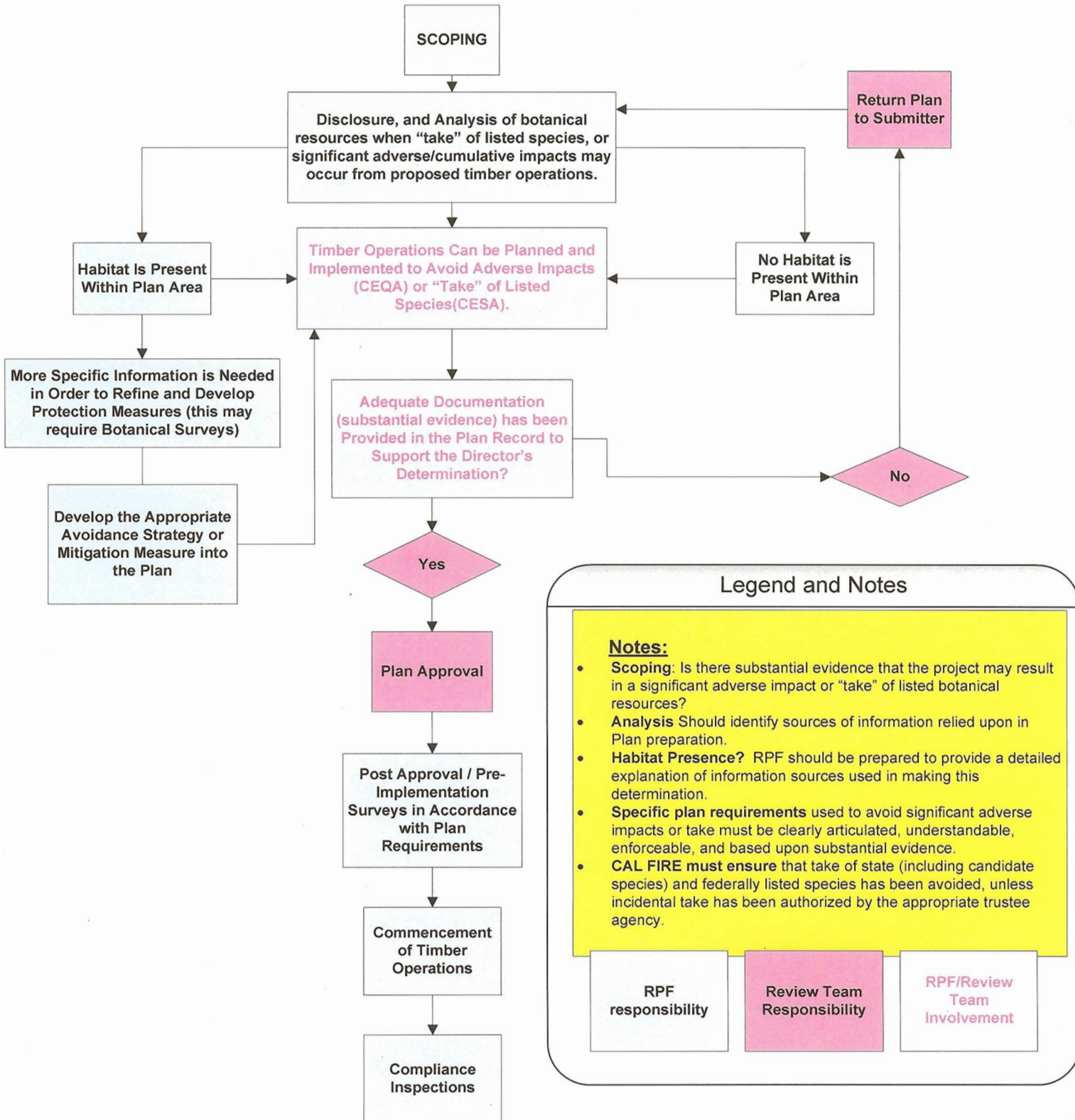
⁵ "Substantial evidence" shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts (CEQA Guidelines § 15184 (b)).

⁶ In 1984 the Legislature uplisted all plants identified as endangered under the Native Plant Protection Act (NPPA) (Fish and Game Code §§1900 – 1913) to endangered under the CESA. Only those plants listed as "rare" under NPPA are still subject to those code sections.

⁷ Under the provisions of the ESA, plants uncommon in one state but common in other states are not eligible for federal listing consideration. Until 1979, a similar policy was followed in California; however, after the passage of the Native Plant Protection Act, plants were considered for protection without regard to their distribution outside the State.

Evaluation Process for Botanical Resources

Thursday, August 06, 2009



CNPS RARE PLANT PROGRAM: PAST AND PRESENT

by Nick Jensen and Aaron E. Sims

The CNPS Rare Plant Program (RPP) got its start in 1968 when legendary botanist and geneticist Dr. G. Ledyard Stebbins began compiling a list of plants having a distribution of less than 100 miles, using the distributions in Dr. Philip Munz's *A California Flora*. This original and important attempt to document the state's rarity was recorded on a set of notecards, and served as the foundation for the first *CNPS Inventory of Rare and Endangered Plants* (the *CNPS Inventory*), published in December 1974.

At this time, the *CNPS Inventory* was the most detailed assemblage of rare plant data for any state in the nation, and it quickly became the most widely used reference on the subject in California (*Fremontia* October 1990). Over the past 40 years the *CNPS Inventory* and RPP have continued as a model of scientific accuracy and integrity, serving as a tool for education, research, conservation, and advocacy.

By 1980 CNPS hired its first full-time Rare Plant Botanist (RPB), Rick York, whose salary initially came from a one-year contract with The Nature Conservancy (TNC) in return for access to CNPS's rare plant information. At that time the Cali-

ifornia Natural Diversity Database (CNDDDB) was a cooperative effort of TNC and the California Department of Fish and Game (now known as the California Department of Fish and Wildlife, or CDFW). By combining staff time and data in a collaborative effort, the success of the effort exceeded all expectations. In late May of 1981, however, the CNDDDB became a part of the Planning Department of CDFW, no longer involving TNC. With this shift in management and end of the initial contract, a new agreement was

proposed. It maintained the same working relationship between CNPS and CNDDDB, but stipulated that CNPS would have to fund the RPB position. The benefits of this relationship were numerous so the motion passed unanimously, and the cooperative agreement between CNPS and CNDDDB continues to this day.

CNPS has now funded the RPB position for more than 33 years. This long-term commitment to the RPP provides continuity in the maintenance of the state's primary catalog

The recent addition of five newly described rare monkeyflowers to the *CNPS Inventory* exemplifies the Rare Plant Program's reliability in providing the state with the most up-to-date conservation status on the California flora. CLOCKWISE FROM TOP LEFT: Sierra Nevada monkeyflower (*Erythranthe sierrae*), limestone monkeyflower (*Erythranthe calcicola*), Carson Valley monkeyflower (*Erythranthe carsonensis*), Santa Lucia monkeyflower (*Erythranthe hardhamiae*), and Red Rock Canyon monkeyflower (*Erythranthe rhodopetra*). All were described in late 2012 and added to the *Inventory* in 2013. All photographs by Naomi Fraga.



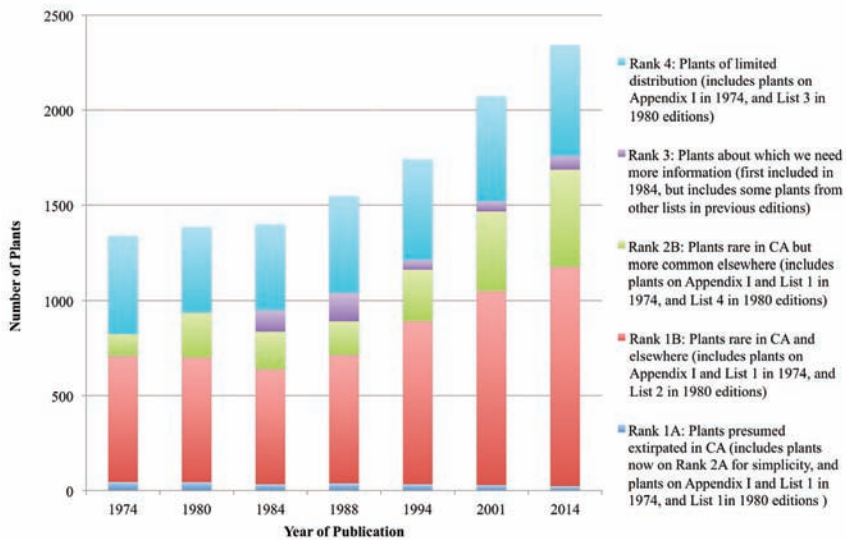
of rare plants. Although the content and composition of the *CNPS Inventory* has changed (see Figure 1, right), the RPB's primary role of maintaining the state's rare plant information has remained constant. These 33 years also serve as a landmark for celebrating CNPS's extensive commitment to collaboration with the state's natural heritage program, the CNDDDB. This close relationship, which includes data sharing and cooperation in the rare plant status review process, is a model of collaboration between a nonprofit organization and a government agency. For more information on the CNDDDB, see the July/October 2001 *Fremontia*, a special double issue on rare plants, and also the tribute on page 28 of this issue by Kristi Lazar on the tremendous long-term commitment of former CNDDDB lead botanist, Roxanne Bittman.

Since 2001 when the last rare plant issue of *Fremontia* was published, the RPP has undergone several major changes. In 2001 the last print edition of the *CNPS Inventory* was published. In the same year, the *Online CNPS Inventory, 7th Edition*, was developed (see sidebar, page 5). Since then, the Society has focused on maintaining the *CNPS Inventory* as a free, online, continuously updated and searchable database.

Another major change occurred in 2005 when the rare plant status review process—the procedure through which plants are added to, removed from, or re-ranked within the *CNPS Inventory*—transitioned from reviews during in-person meetings to an email group and online forum-based process. This reduced the cost associated with conducting status reviews, improved transparency, and fostered the involvement of hundreds of expert reviewers from various occupations throughout California and the world (see Figure 2).

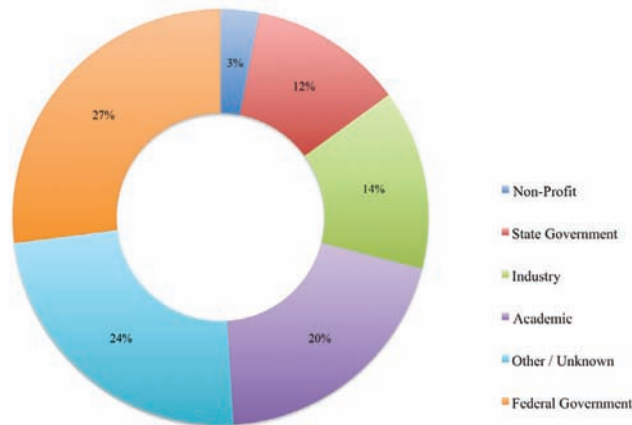
Also, the incorporation of now widely available online data into the status review process, such as

FIGURE 1: COMPOSITION OF THE CNPS RARE PLANT INVENTORY OVER THE PAST 40 YEARS.



Source: CNPS 2014.

FIGURE 2: CONTRIBUTORS TO THE STATUS REVIEW PROCESS.



Affiliations of the more than 400 CNPS rare plant status reviewers. The diversity of qualified reviewers ensures that the final determinations of California Rare Plant Ranks are strong and well vetted.

Source: CNPS 2014.

specimen data in the Consortium of California Herbaria (CCH), has made the ranking of the state's rare plants more efficient and accurate. (See Table 1, page 4, for a list of the California rare plant ranking system categories.) For example, Yolla Bolly Mountains bird's-foot trefoil (*Hosackia yollaboliensis*) was added to California Rare Plant Rank (CRPR) 4, plants of limited distribution, in the first edition of the *CNPS Inventory* based on reviewers' consensus of its rarity during an in-person meeting. Yet a 2013 review of the plant's rarity using CCH specimen data indicated that the trefoil is actually known from

fewer than ten occurrences. For that reason it was subsequently re-ranked to CRPR 1B, plants rare, threatened, or endangered in California and elsewhere.

Other changes to the *CNPS Inventory* in recent years include the addition of CRPRs 2A and 2B, in recognition that some plants on CRPR 1A, presumed extinct, are actually found outside of California and are not endangered. The creation of CRPR 2A as the list containing plants extirpated in California, but common outside of the state, calls attention to some of the threats to plants at the edge of their range.

Additionally, in 2013, in collabo-



TOP: The review of newly available online data revealed that Yolla Bolly Mountain bird's-foot trefoil (*Hosackia yollaboliensis*) was much rarer than originally thought, and it was subsequently reranked. Photograph by Kate Ludwig, Shasta-Trinity National Forest. • ABOVE LEFT: Green-flowered wintergreen (*Pyrola chlorantha*) is one of five species that were recently included in the novel Rank 2A—plants presumed extirpated in California, but common elsewhere. Photograph by Amadej Trnkoczy. • ABOVE RIGHT: Although some plants are found to be more rare after further investigation (as was seen with the Yolla Bolly Mtns. bird's-foot trefoil), Brandegee's clarkia (*Clarkia biloba* subsp. *brandegeae*) was found to be more common than previously thought, through the work of Rare Plant Treasure Hunt volunteers. Subsequently its status was changed from CRPR 1B to CRBR 4. Photograph by Keir Morse.

ration with the California Lichen Society, CNPS made the decision to include rare lichens in the *CNPS Inventory*. This addition and the associated survey protocols (in development) call attention to rare and important members of ecosystems

that are often ignored in biological survey work. Changes such as these are made possible through the guidance of the Rare Plant Program Committee. Created in 2009 and chaired by Jim André, the committee consists of 14 esteemed botanists from

different parts of the state and plays a central role in helping to set RPP priorities. Furthermore, the group is responsible for reviewing changes in rare plant occurrences and helping to achieve consensus when there is disagreement during the status review process.

In recent years collaboration has increased between the RPP, the CNPS Education Program, CNPS Chapters, and members of the public. The Rare Plant Treasure Hunt Project, initiated in 2010, provides

TABLE 1. THE CALIFORNIA RARE PLANT RANKING SYSTEM (CRPR).

- CRPR 1A: Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere
- CRPR 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere
- CRPR 2A: Plants Presumed Extirpated in California, But More Common Elsewhere
- CRPR 2B: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
- CRPR 3: Plants About Which More Information is Needed—A Review List
- CRPR 4: Plants of Limited Distribution—A Watch List

THREAT RANKS

- 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 (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known)

Source: California Native Plant Society, 2014, cnps.org/cnps/rareplants/ranking.php.

CNPS INVENTORY: FROM PRINT TO PIXEL

In 1983 Rick York, Rare Plant Program Botanist, began the task of computerizing more than 15 years of CNPS rare plant data on nearly 1,400 taxa. At the time, one of the claims for computerizing the data was that it would allow users to generate lists of plants by county and by quadrangle (*Fremontia* January 1982). Fewer than ten years later, CNPS released the *Electronic Inventory*, which was acclaimed by then CNPS Vice President for Rare Plants, Dr. Bruce Pavlik, as “one of the most sophisticated natural heritage and inventory software programs in the world.”

The *Electronic Inventory* continued for nearly a decade, alongside the publication of the *CNPS Inventory, 5th Edition*, in 1994, and *6th Edition* in 2001, which would be the last in print format. However, the need for it to be continuously updated and publicly available was becoming increasingly apparent, and North Coast Chapter Delegate, Larry Levine, took it upon himself to develop the *Online CNPS Inventory, 7th Edition*. With no formal training in programming, Larry developed the *7th Edition* using free academic software developed in Slovenia that he discovered through an Internet search.

The *7th Edition* is still in use today, but new programming tools and mapping software led to the need for a revised version in December of 2010, and the current *Online CNPS Inventory, 8th Edition*, was born. The *8th Edition* not only allows users to create lists of rare plants by selecting a location from a map (something past rare plant botanists could only have dreamed of), but allows one to perform a search based on nearly 60 different criteria, as well as by natural communities and key search terms.



Longtime member of CNPS North Coast Chapter and current Chapter Council Vice Chair, Larry Levine, independently developed the first *Online Inventory* in 2001 with no formal training. This was a momentous accomplishment that set the precedent for immediate public access to the most up-to-date information on California's imperiled flora. Photograph by Johanna Rubba.

citizen scientists with the training and background information necessary to search for and document his-

torical occurrences of rare plants throughout California. To date, the project has involved nearly 700

volunteers who have clocked over 12,000 hours while visiting more than 2,100 rare plant occurrences statewide. This is just one example of the tremendous amount of work that volunteers do for the RPP each year.

The value of the thousands of hours spent by CNPS members searching for, documenting, and monitoring rare plants cannot be understated. Yet, as discussed in Bartosh and André's article in this issue of *Fremontia*, protections for California's rare plants are still inadequate, and a lot more needs to be accomplished if we are to protect them. Nevertheless, we remain positive and confident that the RPP and all of its partners will continue to do their part to help preserve California's botanical legacy.

Nick Jensen, 1500 North College Avenue, Claremont, CA 91711, njensen@rsabg.org; Aaron E. Sims, 2707 K Street, Suite 1, Sacramento, CA 95816, asims@cnps.org



Whiteworm lichen (*Thamnolia vermicularis*) is one of fourteen rare lichens now included in the *CNPS Inventory* thanks to recent collaboration between CNPS and the California Lichen Society. It is growing with curled snow lichen (*Flavocetraria cucullata*), a greenish-yellow shrub-like lichen. Photograph by Stephen Sharnoff.

**California Department of Fish and Game Guidelines
for
Conservation of Sensitive Native Plant Resources
Within the Timber Harvest Review Process
and
During Timber Harvesting Operations**

INTRODUCTION

The following information is provided by the California Department of Fish and Game (DFG) to inform timber harvesting plan¹ (THP) applicants, Registered Professional Foresters (RPFs), review agency staff, and the public of DFG's botanical review objectives for projects proposing timber harvesting activities. These guidelines are specific to potential impacts to sensitive native plant species². Although these guidelines are not mandatory (outside of specific requirements of law), they are designed to avoid delays caused by inadequate biological information in the THP review process. Their use is anticipated to maximize the limited resources of the review agencies, to meet the California Environmental Quality Act (CEQA) requirements for adequate disclosure of potential impacts, and to conserve public trust resources.

DFG TRUSTEE AGENCY MISSION

The mission of DFG is to manage California's diverse wildlife and native plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. DFG has jurisdiction over the conservation, protection, and management of wildlife, native plants, and habitat necessary to maintain biologically sustainable populations (Section 1802, Fish and Game Code). DFG, as trustee agency under CEQA (Section 14 CCR 15386, CEQA Guidelines), provides expertise to review and comment upon environmental documents and makes recommendations regarding potential negative impacts to those resources held in trust for the people of California. As a member of the Review Teams established pursuant to the California Forest Practice Rules (Section 1037.5), DFG reviews THPs and makes recommendations designed to avoid or mitigate potential project impacts to biological resources.

¹ As used in this document, the terms "timber harvesting plan", "THP", and "plan" refer to Timber Harvesting Plans, Nonindustrial Timber Management Plans (NTMP), Program Timber Harvesting Plans, and Modified Timber Harvesting Plans as defined in the California Forest Practice Rules.

² Sensitive plants include those plants listed as endangered, threatened or rare (Section 670.2, Title 14, California Code of Regulations; Section 1900, Fish and Game Code; ESA Section 17.11, Title 50, Code of Federal Regulations) or those meeting the definitions of rare or endangered provided in Section 15380 of the CEQA Guidelines.

SENSITIVE PLANT RESOURCE GUIDELINES

PRE-CONSULTATION

Pre-consultation identifies potential botanical resource concerns early in plan development and fosters the collaborative development of management strategies that meet both project goals and resource needs. Registered Professional Foresters (RPFs) are encouraged to contact DFG's Timberland Planning Program staff during development of THPs when proposed operations may adversely impact sensitive plant species.

OWNERSHIP-WIDE RESOURCE INFORMATION

DFG encourages landowners to acquire adequate information on sensitive native plants and plant communities within their ownership, and to develop and implement effective ownership-wide conservation and management efforts for these plants. Pre-consultation with DFG timber planning staff can facilitate this process. DFG is interested in working with landowners to develop strategies that conserve and manage sensitive botanical resources while meeting timber management goals. Effective management of sensitive plants and adequate information at the ownership and/or landscape scale will enhance management options and flexibility for these plants within individual THP areas. This information will also provide a framework to assess potential direct, indirect, and cumulative impacts to sensitive native plants as required by CEQA and the Forest Practice Rules.

ASSESSMENT OF SENSITIVE PLANTS

Timber operations that have the potential to impact sensitive plants include but are not limited to harvesting, road and landing construction, watercourse crossings, and site preparation. DFG is also concerned about the potential effects of herbicide treatment on sensitive plants. Adequate information about the vegetation types present within the THP area, any sensitive plants that are known to or are likely to occupy those vegetation types, and the potential impacts to any such plants is necessary to properly assess potential impacts to sensitive plant resources. Where potential significant adverse impacts are identified, protection measures designed to avoid or mitigate the impacts should be included in the THP. Forest Practice Rules § 1034(w).

Scoping

The success of conserving native plants that could be adversely affected by timber harvesting operations begins with adequate scoping by the project proponent. Scoping entails the compilation of relevant botanical information in the general project area. Scoping includes, but is not limited to, full and complete disclosure of all native plants at risk from the proposed timber harvesting operations. Proper

scoping provides sufficient biological information on the presence and absence of these plants and their habitats to make informed decisions. DFG cannot over-emphasize the importance of proper and thorough scoping. Adequate scoping will:

- Facilitate timely review by identifying relevant sensitive native plant issues;
- Focus information-gathering efforts on site-specific botanical resources;
- Focus plant surveys to key locations and important habitats where sensitive native plants could occur; and
- Clearly demonstrate whether sensitive native plant resources are at risk.

Adequate scoping begins with identification of vegetation and habitat types on a regional scale using the USGS 7.5' quadrangle on which the project is located and the adjacent quadrangles. A list of sensitive plant species that have the potential to occur within identified vegetation types is then developed. Analysis is improved, and omissions largely avoided, when the assessment area is comprehensive and ecologically relevant.

At the project level, scoping identifies types of vegetation and habitat within the THP area, as well as sensitive plants that may be impacted by the project. The identification of habitat and vegetation types should utilize a recognized classification system (i.e., Sawyer and Keeler-Wolf (1995), Holland (1986), Cheatham and Haller (1975), Munz and Keck (1970), and Mayer and Laudenslayer (1988)). The most recent detailed list of vegetation types known from California is available from <http://www.dfg.ca.gov/whdab/pdfs/natcomlist.pdf>. Habitat features within the forest landscape (e.g., forest openings, rock outcrops, wetlands, vernal pools, and serpentine substrates), occurring within the project area should also be discussed or mapped.

Preliminary information about sensitive plants within a project area can be derived from DFG's Wildlife and Habitat Data Analysis Branch (WHDAB). The WHDAB maintains the California Natural Diversity Database (CNDDDB), which tracks California's sensitive animals, plants, and habitats. The WHDAB also produces the *Special Vascular Plants, Bryophytes, and Lichens List* (Special Plants List) consisting of approximately 2,000 species, subspecies, or varieties of plants that are state and/or federally listed, proposed for listing, candidate species, and of concern due to rarity, threats, or close association with declining habitats, or species for which more information is needed. Status and threat rankings are assigned to plant taxa on the Special Plants List. To guide disclosure and assessment of potential impacts to plants, DFG has developed guidelines that may be used to assess the effects of proposed projects on rare and endangered plants and natural communities. These guidelines and Special Plants List can be found on WHDAB's web page: www.dfg.ca.gov/whdab/html/plants.html

Additional sources of information about sensitive plants potentially occurring within the project area are also available. These sources may include, but are not limited to, state and federal resource agency lists, *the California Native Plant Society*

(CNPS) *Inventory of Rare and Endangered Plants of California*, the CNPS Online *Inventory* (<http://www.northcoast.com/~cnps/cgi-bin/cnps/sensinv.cgi>), taxonomic references, agency contacts, environmental documents for other projects in the vicinity, the project proponent's knowledge of occurrences on the ownership, academics, and professional or scientific organizations.

List of Sensitive Plants

Proper scoping will result in the compilation of a comprehensive list of sensitive plants known to occur within the appropriate assessment area, as well as plants that are not known to occur within the assessment area, but for which the project area includes appropriate habitat and is within the species known range.

The THP should contain information about each sensitive plant with the potential to occur within the project area. This information may typically include:

- An informative discussion of the habitat characteristics and life history requirements of the species;
- An assessment of the quality, quantity, and location of potential habitat within the project area; and
- The current conservation status (i.e., Federal Endangered Species Act (ESA) and/or California Endangered Species Act (CESA) listing status, NDDDB Rank, U.S. Forest Service and/or Bureau of Land Management status, CNPS status, or if the species meets the criteria of Section 15380 CEQA Guidelines).

When potential habitat exists, the document should include a discussion of the efforts made to determine the presence or absence of the species within and immediately adjacent to the project area. If potential habitat for sensitive plants occurs within the project area and the proposed project activities have potential to impact the habitat, a botanical survey is usually appropriate. Alternately, the applicant may discuss and explain why no survey was conducted when suitable sensitive plant habitat occurs within the project area (e.g., the suitable habitat will be completely avoided).

Surveys

If potential habitat for sensitive plants occurs within the project area and the proposed project activities have the potential to impact the habitat, a botanical survey should usually be conducted. Information obtained through botanical surveys is used to assess potential impacts and to develop appropriate protection and/or mitigation measures during THP preparation and review. Surveys may not be necessary if suitable protection measures are implemented (e.g., the plan identifies potential habitat and excludes it from timber operations). Surveys are best conducted during THP development and included in the plan when it is initially submitted. These surveys provide site-specific information that enables DFG and

the California Department of Forestry and Fire Protection (CDF) to better evaluate the project's potential impacts and, when necessary, to better develop recommendations to mitigate potential impacts. If a THP indicates surveys will be conducted prior to operations but after plan approval, the plan shall provide specific protection measures that will be implemented if the species is located during the subsequent surveys (CEQA Guidelines Section 15126.4(a)(1)(B)). Mitigation measures are discussed in a following section.

Sensitive plant surveys should be scientifically rigorous and sufficient to ensure that the presence or absence of the target species can be determined with confidence. Surveys should be conducted in a manner consistent with the methodology presented in the DFG's *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities*. These guidelines are available at www.dfg.ca.gov/whdab/html/plants.html. It is recommended that survey reports include a discussion of the survey methods, dates and duration, personnel involved and their qualifications, maps (habitat and survey route), reference sites and materials, and survey results including an overall species list of plants encountered in the field. Depending on the phenology (flowering period) of sensitive plants potentially occurring in the project area, it may be necessary to survey a plan area at more than one time of the year.

If sensitive plants occur within the project area, the following information should be included in the THP. This information will enable reviewing agencies and the public to effectively evaluate the plan and will guide the development of protection measures:

- The locations and distribution of occurrences clearly marked on a topographic map. Global Positioning System (GPS) data (if taken) are also useful.
- A discussion of the significance of occurrence(s), which should include, but not be limited to, any important or unusual characteristics of the occurrence (e.g., unique morphology or habitat requirements), information about any other nearby occurrences including population sizes, and the geographic range of the species.
- Population size (a complete census for small occurrences or an estimate determined by sampling for large occurrences) and if applicable, information about the percentage of individuals in each life stage such as seedlings vs. reproductive individuals;
The specific site characteristics of occurrences, such as vegetation or habitat type, overstory canopy closure, shrub and herbaceous layer characteristics, associated species, topographic position, aspect, hydrological characteristics, soil type and texture, soil parent material, and land use/management history.

In addition, the plan should include completed CNDDDB field forms with locations mapped on a portion of a USGS 7.5' topographic map. The CNDDDB field form is available on DFG's web page (<http://www.dfg.ca.gov/whdab/html/plants.html>).

Copies should be sent to the CNDDDB and the appropriate DFG Regional office. This information is important for future management decisions including the appropriate conservation status of the species.

When operations are proposed at a site within a long-term project area (e.g., NTMPs), surveys should normally be re-conducted if the site has not been surveyed within the past five years. Reliance upon dated surveys may not be effective because of fluctuations in species abundance and/or localized occurrence; colonization resulting from seed dispersal, seed bank exposure, habitat alteration, or vegetation maturation; and changes in the conservation status of individual taxa.

The occurrences of any sensitive plant should be brought to the attention of all personnel conducting timber operations, road maintenance activities, vegetation management (herbicides and mechanical means) and stand-tending operations (such as precommercial thinning). Field visits to sensitive plant locations should occur at the appropriate times of years so field personnel are aware of the appearance of the sensitive plants as well as the habitats and specific locations in which the plants occur. Specific ecological requirements of sensitive plants should be discussed while in the field.

IMPACT ANALYSIS

An assessment of all potential project-related impacts to the sensitive plant(s) should be presented. As stated above, of interest to DFG are all timber operations that will or may impact sensitive plants, including timber falling and yarding, road and landing construction, watercourse crossings, site preparation, and herbicide treatments. Cumulative impacts as a result of multiple projects within the range of the species should also be addressed, as required by CEQA and the Forest Practice Rules.

Development of Mitigation Measures

CEQA and the Forest Practice Rules require that if there is a potential to significantly impact sensitive plants, then measures to avoid or mitigate these impacts must be proposed. When developing plant protection measures, plan preparers should consider both the specific mechanisms by which the proposed operations could impact each plant species, and the best available information about its habitat needs and life requisites. Impacts to sensitive plants can often be avoided by careful planning and implementation of the project activities, by avoiding the habitat, or by protecting the population and associated habitat. Impacts may be reduced by partial avoidance of the population and associated habitat. DFG will recommend appropriate mitigation measures during THP review. Examples of such measures may include, but are not limited to:

- Modification of timber operations to better suit the habitat requirements and to ecologically benefit the plant in question.

Establishment of a large enough area around the population to clearly delineate the location of the occurrence area (a buffer zone) to protect the population from potential impacts. The buffer should be of adequate size to preserve connectivity between populations, pollinator ecology, and provide for natural expansion and contraction of the occurrence area due to natural perturbations at the site.

- Directional falling of timber away from the area.
- Designation of an equipment exclusion zone or equipment limitation zone around the occurrence, as appropriate.
- Retention of the overstory canopy in the buffer area (for shade and/or mesic dependent species).
- Maintenance of site hydrology.
- Exclude site preparation or herbicide application in or in close proximity to the occurrence area.
- Establishment of off-site mitigation for permanent protection.

Additional or alternative measures³ may be needed depending on the species, the site, and the specific operations proposed.

Monitoring

Pursuant to CEQA Section 21081.6 and Guidelines Section 15097, when a lead agency adopts a mitigation for significant effects, the agency is required to adopt either a monitoring or reporting program for the mitigation measures in order to ensure compliance during project implementation. CEQA requires that the mitigation or avoidance measures be fully enforceable. Therefore, compliance monitoring and/or reporting is usually needed to ensure timber operations are carried out consistent with the protection measures specified in a THP.

DFG encourages landowners to conduct or otherwise participate in effectiveness monitoring to determine the adequacy of the implemented protection measures. DFG is interested in working with landowners to help design and conduct effectiveness monitoring whenever time and resources permit. Such monitoring will enable both landowners and reviewing agencies to learn from their actions, to increase the often limited ecological knowledge about sensitive plants, and to improve future management strategies and recommendations. DFG recommends the following be considered and/or included when designing monitoring projects:

- Consult with DFG regarding the study design before implementation.
- Determine the roles of the landowner, the forester, consultants, DFG, and CDF in the monitoring effort.

³ DFG generally does not support mitigation strategies for sensitive plants that use transplantation, relocation, or reintroduction. A review of these strategies indicated a success rate of less than 15% (Fiedler 1991). Transplantation of populations (especially the seed bank) should be conducted only as a last resort or in conjunction with other mitigation strategies.

Involve an individual familiar with the species, associated plant species, vegetation and habitat types, and measuring and monitoring methods when designing data collection.

- Implement a field monitoring scheme to enable an assessment of the impacts and effectiveness of the protection/mitigation measures. This may include treatment and control plots.

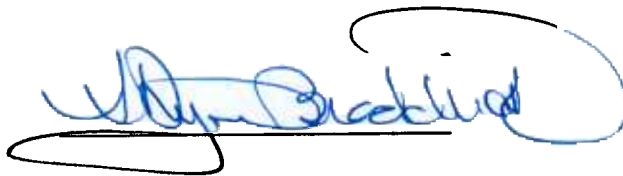
Monitor before and for at least three to five years after timber operations and/or vegetation management.

Utilize a data sheet for the collection of standardized data, and establish repeatable photo points that depict both the habitat and the species.

Apprise DFG of the monitoring program's progress and findings through interim and final reports.

SUMMARY

DFG, as a trustee agency, is responsible for conserving, protecting, and managing sensitive plants, and the habitats necessary to maintain biologically sustainable populations. This responsibility requires the review of CEQA documents and documents prepared for certified regulatory programs such as the timber harvest review process. DFG also makes recommendations to ensure the protection of sensitive botanical resources during project implementation. Providing the information necessary for DFG and CDF to assess the potential for timber operations to adversely affect plant resources usually requires the inclusion of adequate scoping information, vegetation and plant descriptions, surveys, and protection measures within a THP. Monitoring during and after a project can provide all involved parties additional information about the response of sensitive plants to specific timber operations and the effectiveness of specific protection measures.



07/25/05
Date

Approved

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