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*protecting and restoring natural ecosystems and imperiled species through  
science, education, policy, and environmental law  
via electronic and US mail*

December 23, 2009

BLM California Desert District  
22835 Calle San Juan de los Lagos  
Moreno Valley, California 92553,  
Attn: Janet Eubanks

California Energy Commission  
1516 Ninth Street, MS-15  
Sacramento, California, 95814,  
Attn: Eric Solorio

<b>DOCKET</b> 09-AFC-9
DATE DEC 23 2009
RECD. JAN 15 2010

**RE: Comments on the Notice of Intent (“NOI”) to prepare an Environmental Impact Statement (EIS) for the Proposed Solar Millennium Ridgecrest Solar Power Project, Kern County, CA and Possible Land Use Plan Amendment and Staff Assessment (SA). 74 FR 61168.**

Dear Ms. Eubanks and Mr. Solorio,

Please accept the following comments on the Notice of Intent (“NOI”) to prepare an Environmental Impact Statement (EIS) for the Proposed Solar Millennium Ridgecrest Solar Power Project, Kern County, CA and Possible Land Use Plan Amendment and Staff Assessment (SA) in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended, and the California Environmental Quality Act (CEQA), on the impacts of the Solar Millennium Ridgecrest Solar Power Project on behalf of the Center for Biological Diversity (the “Center”). This project is proposed by the Department of the Interior, Bureau of Land Management (“BLM”), together with the California Energy Commission (“CEC”),

The Center is a non-profit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. These scoping comments are submitted on behalf of the Center’s 240,000 staff, members and online activists throughout California and the western United States.

The development of renewable energy is a critical component of efforts to reduce greenhouse gas emissions, avoid the worst consequences of global warming, and to assist California in meeting emission reductions set by AB 32 and Executive Orders S-03-05 and S-21-09. The Center for Biological Diversity strongly supports the development of renewable energy production, and the generation of electricity from solar power, in particular. However, like any project, proposed solar power projects should be thoughtfully planned to minimize impacts to the environment. In particular, renewable energy projects should avoid impacts to sensitive species and habitat, and should be sited in proximity to the areas of electricity end-use in order to reduce the need for extensive new transmission corridors and the efficiency loss associated with extended energy transmission. Only by maintaining the highest environmental standards with regard to local impacts, and effects on species and habitat, can renewable energy production be truly sustainable.

Arizona • California • Nevada • New Mexico • Alaska • Oregon • Montana • Illinois • Minnesota • Vermont • Washington, DC

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The Solar Millennium Ridgecrest Solar Power Plant is proposed to consist of two solar fields for concentrating solar, a power block electricity generating plant, and related facilities, and requires a proposed land use plan amendment to the 1980 California Desert Conservation Area (CDCA) Plan, as amended.

Currently the proposed site is relatively devoid of human disturbance except for a few dirt roads and the existing transmission lines and associated structures.

The Energy Production and Utility Corridors section of the California Desert Conservation Area Plan (1980) as amended requires at minimum that the following resource issues be addressed:

- 1) Consistency with the Desert Plan, including designated and proposed planning corridors;
- 2) Protection of air quality;
- 3) Impact on adjacent wilderness and sensitive resources;
- 4) Visual quality;
- 5) Cooling-water source(s);
- 6) Waste disposal;
- 7) Seismic hazards; and
- 8) Regional equity.

Additionally, a number of other resources are of concern to us and need to be addressed in detail as follow below:

#### **Biological Resources**

Based on the preliminary finding in the biological sections of the application, it appears that the site is ecologically functional desert landscape and hosts a suite of rare animal species currently on the site. Careful documentation of the current site resources is imperative in order to analyze how best to site the project to avoid and minimize impacts and then to mitigate any unavoidable impacts.

#### *Biological Surveys and Mapping*

The Center requests that thorough, seasonal surveys be performed for sensitive plant species and vegetation communities, and animal species under the direction and supervision of the BLM and CEC and resource agencies such as the US Fish and Wildlife Service and the California Department of Fish and Game. Full disclosure of survey methods and results to the public and other agencies without limitations imposed by the applicant must be implemented to assure full NEPA/CEQA compliance.

Confidentiality agreements should not be allowed for the surveys in support of the proposed project. Surveys for the plants and plant communities should follow California Native Plant Society (CNPS) and California Department of Fish and Game (CDFG) floristic survey guidelines (see Exhibits CNPS Botanical Survey Guidelines; CDFG Survey Guidelines) and should be documented as recommended by CNPS (Exhibit CNPS Documentation Guidelines) and California Botanical Society policy guidelines. A full floral inventory of all species encountered needs to be documented and included in the EIS/SA. Surveys for animals should

include an evaluation of the California Wildlife Habitat Relationship System's (CWHR) Habitat Classification Scheme. All rare species (plants or animals) need to be documented with a California Natural Diversity Data Base form and submitted to the California Department of Fish and Game (Exhibit CNDDDB Form) as per the State's instructions (Exhibits Ex. CNDDDB Instructions; CNDDDB GIS Instructions).

The Center requests that the vegetation maps be at a large enough scale to be useful for evaluating the impacts. Vegetation/wetland habitat mapping should be at such a scale to provide an accurate accounting of wetland and adjacent habitat types that will be directly or indirectly affected by the proposed activities. A half-acre minimum mapping unit size is recommended, such as has been used for other development projects. Habitat classification should follow CNPS' Manual of California Vegetation.

Adequate surveys must be implemented, not just a single season of surveys, in order to evaluate the existing on-site conditions. Due to unpredictable precipitation, desert organisms have evolved to survive in these harsh conditions and if surveys are performed at inappropriate times or year or in particularly dry years many plants that are in fact on-site may not be apparent during surveys (ex. annual and herbaceous perennial plants).

*Impact Analysis*

The EIS/SA must evaluate all direct, indirect, and cumulative impacts to sensitive habitats, including impacts associated with the establishment of unpermitted recreational activities, the introduction of non-native plants, the introduction of lighting, noise, and the loss and disruption of essential habitat due to edge effects.

A number of rare resources are known to occur or have high potential to occur on the site including;

<i>Common Name</i>	<i>Scientific Name</i>	<i>State/Federal/Other Status</i>
Desert Tortoise	<i>Gopherus agassizii</i>	CT/FT
Burrowing owl	<i>Athene cunicularia hypugaea</i>	CSC/BLM SS
Loggerhead shrike	<i>Lanius ludovicianus</i>	CSC/FSC/MB
Golden eagle	<i>Aquila chrysaetos</i>	CSC/FSC/FP/BLM SS
LeConte's thrasher	<i>Toxostoma lecontei</i>	CSC/BLM SS
Mohave ground squirrel	<i>Spermophilus mohavensis</i>	CT
American badger	<i>Taxidea taxus</i>	CSC
<p><b>State Designation</b>            CE State listed as endangered. Species whose continued existence in California is jeopardized.            CT State listed as threatened. Species that although not presently threatened in California with extinction are likely to become endangered in the foreseeable future.            CSC California Department of Fish and Game "Species of Special Concern." Species with declining populations in California.            FP Fully protected against take pursuant to the Fish and Game Code Sections 3503.5, 3511, 4700, 5050, 5515.</p> <p><b>Federal Designation</b>            FE Federally listed as endangered.            FT Federally listed as threatened.            MB Migratory Bird Treaty Act. of 1918. Protects native birds, eggs, and their nests.            BCC U.S. Fish and Wildlife Service Bird of Conservation Concern.            BLM SS BLM Sensitive Species.</p>		

All of these species have been identified as either occurring on the site from the surveys performed in 2009<sup>1</sup> or having a high probability to occur on the site.<sup>2</sup> Therefore, the EIS/SA must adequately address the impacts and propose effective ways to avoid, minimize, and mitigate the impacts to these resources through alternatives including alternative siting and alternative on-site configurations.

### *Desert Tortoise*

The desert tortoise is continuing to decline throughout its range despite being under federal and state Endangered Species Acts protection as threatened<sup>3</sup>. Despite the project site being outside of federally designated critical habitat and the desert wildlife management areas (DWMAs) as identified in the West Mojave Plan<sup>4</sup>, it is reported to sustain a high density of desert tortoise with an estimated 69 desert tortoise on site<sup>5</sup>. The document must clearly address alternative proposals for avoiding, minimizing and mitigating the impacts to the desert tortoise and its occupied habitat.

The BLM must first look at ways to avoid impacts to the desert tortoise, for example, by identifying and analyzing *alternative sites* outside of desert tortoise occupied habitat or in areas that have already been severely disturbed by other prior land use as well as alternative project configurations that would avoid or significantly reduce impacts. The BLM and CEC must also look at ways to minimize any impacts that it finds are unavoidable, for example, by limiting the ground disturbing activities from the project and limiting access roads to the project. Acquisition of lands that will be managed in perpetuity for conservation must be included as part of the strategy to mitigate impacts to the tortoise, mitigation lands should also be high-quality habitat and, at minimum 5:1 mitigation should be provided of all acres of desert tortoise habitat destroyed. Set-aside conservation lands are particularly important because the project as proposed appears to have little or no compatibility with on-site conservation for desert tortoise.

Translocation as a long-term strategy for minimizing and mitigating impacts to desert tortoise may be a tool for augmenting conservation of the desert tortoise<sup>6</sup>, but it cannot substitute for other mitigation such as preservation of habitat. Moreover, to date, translocation does not have a proven track record of success. If translocation is to be a part of the mitigation strategy, a detailed plan must be included as part of the EIS/SA, and include methodologies for determining appropriate conservation area where tortoises may be translocated, impacts to existing "host" tortoise populations that occur on the translocation site, when/how the tortoise are to be translocated, how tortoise diseases will be addressed, and requisite monitoring of host and translocated tortoises; etc.. Monitoring of the translocated and existing "host" tortoises needs to occur for a long enough time period that is realistic to evaluate success of the translocation – definitely longer than a single year – 10 years may be a more realistic minimum for tracking impacts to this long lived species. Success criteria for translocation must also be clearly

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<sup>1</sup> Solar Millennium 2009 at pg. 5.3-28

<sup>2</sup> Ibid

<sup>3</sup> USFWS 2009

<sup>4</sup> BLM 2006

<sup>5</sup> Solar Millennium 2009 at pg. 5.3-35

<sup>6</sup> Field et al. 2007

identified. The temporary project site needs to be fenced with tortoise proof fencing during construction and the permanent project sites need to be fenced to prevent tortoise mortality. All associated roads also need to be fenced.

An aggressive raven prevention plan also needs to be developed as part of the EIS/SA and followed during project development and implementation.

#### ***Mohave Ground Squirrel***

Approximately 844 acres of the proposed project are located in the Mohave ground squirrel conservation area<sup>7</sup> as identified in the West Mojave Plan<sup>8</sup>. At least one alternative should evaluate the reduction of impacts to this rare species by moving the project out of the boundaries of the conservation area for this species.

If the project remains on the proposed site, acquisition lands will be required as part of the mitigation and will need to be managed in perpetuity for conservation. Mitigation lands should be high-quality habitat and, at minimum 5:1 mitigation should be provided of all acres of Mohave ground squirrel habitat destroyed. Additional measures for avoidance and minimization should also be incorporated into the evaluation of impacts to this species.

#### ***Burrowing Owl***

The seven active burrows and eight birds, including two nesting pairs with juveniles, indicates the site is excellent habitat for this declining species, especially in the northern Mojave/Eastern Sierra where populations are typically very low<sup>9</sup>. At least one alternative should evaluate the reduction of impacts to this rare species by moving the project away from the nesting burrows.

If the project remains on the proposed site, acquisition lands will be required as part of the mitigation and will need to be managed in perpetuity for conservation. Mitigation lands should be high-quality habitat and, at minimum 5:1 mitigation should be provided of all acres of burrowing owl habitat destroyed. Additional measures for avoidance and minimization should also be incorporated into the evaluation of impacts to this species.

#### ***Other Rare Species***

The diversity of rare species found on the 3920 acres of the site is impressive and suggests that the site is ecologically intact and functioning<sup>10</sup>. The BLM and CEC must clearly address a proposal for avoiding, minimizing and mitigating the impacts to all of the rare species that utilize the site for part or all of their lifecycle.

Acquisition of lands that will be managed in perpetuity for conservation must be included as part of the strategy to avoid, minimize and mitigate impacts to the other species found on site as well. Acquisition is particularly important for these species because the proposed project

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<sup>7</sup> Solar Millennium 2009 at Appendix F pg. 8

<sup>8</sup> BLM 2006

<sup>9</sup> IBP 2008

<sup>10</sup> Solar Millennium 2009

appears to have no compatibility with any type of on-site conservation of plant communities or wildlife.

The preliminary surveys did not document raptors other than the burrowing owl on site, however we have concerns that the project site is foraging habitat for golden eagles. Please include surveys for this species.

If future surveys identify rare plant species occurring on the project site mitigation will need to be identified. In general, transplantation of rare species has not been a great success<sup>11</sup>. If transplantation is to be a part of the mitigation strategy, a detailed plan must be included as part of the EIS/SA on the methodology for determination of appropriate conservation area where plants may be transplanted, when/how plant are to be transplanted and identification of success criteria for transplantation. Monitoring of the transplanted plants needs to occur for a time period that is realistic to evaluate long-term success of the plants.

#### *Locally Rare Species*

The Center requests that the EIS/SA evaluate the impact of the proposed permitted activities on locally rare species (not merely federal- and state-listed threatened and endangered species). The preservation of regional and local scales of genetic diversity is very important to maintaining species. Therefore, we request that all species found at the edge of their ranges or that occur as disjunct locations be evaluated for impacts by the proposed permitted activities.

#### **Water Resources**

The project appears to impact on-site drainages including a large wash that bisects the proposed project site. The EIS/SA document must clarify the impacts to the jurisdictional Waters of U.S. and the Water of the State of California, and avoid, minimize and mitigate any impacts. While the Application indicates that 16.6 acres of state waters will be affected by the project, these impacts should be avoided to the greatest extent possible and if impacts remain they must be mitigated. In doing so, any reroute of waters and drainage on the site must assure that downstream processes are not impacted.

An evaluation of the effect of additional groundwater pumping (in conjunction with other groundwater issues [pumping, nitrate plume etc.] in the basin) on the water quality in the basin and surface water resources; and its effect on the native plant and animal species and their habitats need to be included in the EIS/SA.

#### **Alternatives**

The EIS/SA must include a robust analysis of alternatives, including a private lands alternative and alternatives using other technologies including distributed generation. The stated objectives of the project must not unreasonably constrain the range of feasible alternatives evaluated in the EIS/SA. The BLM and CEC must establish an independent set of objectives that does not unreasonably limit the EIS/SA's analysis of feasible alternatives including alternative sites. At a minimum alternatives including the no-action alternative, an environmentally

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<sup>11</sup> Fiedler 1991

preferred alternative and an alternative where power generation is sited adjacent to power consumption need to be included.

#### **Other Issues**

The construction and operation of the proposed facility will also increase greenhouse gas emissions and those emissions should be quantified and off-set. This would include the manufacture and shipping of components of the project and the car and truck trips associated with construction and operations. Similarly, such activities will also impact air quality and traffic in the area and these impacts should be disclosed, minimized and mitigated as well. For mobile sources, since consistency with the AQMP will not necessarily achieve the maximum feasible reduction in mobile source greenhouse emissions, the EIS/SA should evaluate specific mitigation measures to reduce greenhouse emissions from mobile sources.

#### *Fire Impacts*

Because the project will be creating high temperature liquids, fire prevention including best management practices must be addressed and clearly identified in the EIS/SA. Not only on-site protection of resources, but also preventing fire from moving into the adjacent lands. Fire is incredibly detrimental to desert ecosystems, resulting in degradation of the habitat and if frequently reburned results in a type conversion to non-native vegetation<sup>12</sup>.

#### *Non-Native Plants*

The EIS/SA must identify and evaluate impacts to species and ecosystems from invasive exotics species. Many of these species invade disturbed areas, and then spread into wildlands. Fragmentation of intact, ecologically functioning communities further aides the spread and degradation of plant communities<sup>13</sup>. Additionally, landscaping with exotic species is often the vector for introducing invasive exotics into adjacent habitats. Invasive landscape species displace native vegetation, degrade functioning ecosystems, provide little or no habitat for native animals, and increase fire danger and carrying capacity<sup>14</sup>. All of these factors for wildland weeds are present in the project, and their affect must be evaluated in the EIS/SA.

#### *Wildlife Movement*

A thorough and independent evaluation of the project's impacts on wildlife movement is essential. The EIS/SA must evaluate all direct, indirect, and cumulative impacts to wildlife movement corridors. The analysis should cover movement of large mammals, as well as other taxonomic groups, including small mammals, birds, reptiles, amphibians, invertebrates, and vegetation communities. The EIS/SA should first evaluate habitat suitability within the analysis window for multiple species, including all listed and sensitive species. The habitat suitability maps generated for each species should then be used to evaluate the size of suitable habitat patches in relation to the species average territory size to determine whether the linkages provide both live-in and move-through habitat. The analyses should also evaluate if suitable habitat patches are within the dispersal distance of each species. The EIS/SA should address both individual and intergenerational movement (i.e., will the linkages support metapopulations of

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<sup>12</sup> Brooks and Draper 2006

<sup>13</sup> Bossard et al 2000

<sup>14</sup> Brooks 2000

smaller, less vagile species). The EIS/SA should identify which species would potentially utilize the proposed wildlife movement corridors under baseline conditions and after build out, and for which species they would not. In addition, the EIS/SA should consider how wildlife movement will be affected by other planned approved, planned, and proposed development in the region as part of the cumulative impacts.

The EIS/SA should analyze whether any proposed wildlife movement corridors are wide enough to minimize edge effects and allow natural processes of disturbance and subsequent recruitment to function. The EIS/SA should also evaluate whether the proposed wildlife movement corridors would provide key resources for species, such as host plants, pollinators, or other elements. For example, many species commonly found in riparian areas and washes depend on upland habitats during some portion of their cycle. Therefore, in areas with intermittent or perennial streams, upland habitat protection is needed for these species. Upland habitat protection is also necessary to prevent the degradation of aquatic habitat quality.

### **Cumulative Impacts**

Because of the number of projects that are proposed in the project vicinity and the region, a thorough analysis of the cumulative impacts from all of these projects on the resources needs to be included.

Thank you for your consideration of these comments. Please add us to the distribution list for the EIS/SA and all notices associated with the project.

Sincerely,



Heene Anderson  
Biologist/Public Lands Desert Director  
Center for Biological Diversity



## References

- Bossard, C.C., J.M. Randall and M.C. Hoshovsky. 2000. Invasive Plants of California's Wildlands. University of California Press. Berkeley, CA. Pgs. 360.
- Brooks, M. L. 2000. Competition between alien annual grasses and native annual plants in the Mojave desert. *Am. Midl. Nat.* 144:92–108.
- Brooks, M.L. and J.V. Draper 2006. Fire effects on seed banks and vegetation in the eastern Mojave desert: Implications for post-fire management. extended abstract, U.S. Geological Survey, Western Ecological Research Center, Henderson, Nevada, pg. 3. Available at [http://www.nps.gov/moja/naturescience/upload/Fire%20congress%202006\\_brooks%20and%20draper\\_extended%20abstract.pdf](http://www.nps.gov/moja/naturescience/upload/Fire%20congress%202006_brooks%20and%20draper_extended%20abstract.pdf)
- Bureau of Land Management (BLM), U.S. Department of Interior  
2006. Final Environmental Impact Statement/Proposed West Mojave Desert Management Plan and Amendment to the California Desert Conservation Area Plan. + Appendices.  
  
1980. California Desert Conservation Area Plan as amended. Pgs. 159 + appendices.
- Institute for Bird Populations (IBP) 2009. Survey results for Breeding Burrowing Owl Survey in California. Available at [http://www.birdpop.org/DownloadDocuments/BUOW\\_ENEWSLETTER\\_spring\\_2008.pdf](http://www.birdpop.org/DownloadDocuments/BUOW_ENEWSLETTER_spring_2008.pdf)
- Solar Millennium #09-AFC-09. 2009. Application for Certification available at [http://www.energy.ca.gov/sitingcases/solar\\_millennium\\_ridgecrest/documents/applicant/afc/](http://www.energy.ca.gov/sitingcases/solar_millennium_ridgecrest/documents/applicant/afc/)
- Field, K.J., C. R. Tracy, P.A. Medica, R.W. Marlow, P.S. Corn. 2007. Return to the Wild: Translocation as a tool in conservation of the Desert Tortoise (*Gopherus agassizii*). *Biological Conservation* 136: 232-245.
- U.S. Fish and Wildlife Service (USFWS) 2009. Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2007 Annual Report. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. Pgs. 77 Available at [http://www.fws.gov/Nevada/desert\\_tortoise/documents/reports/2007\\_Rangewide\\_Desert\\_Tortoise\\_Population\\_Monitoring.pdf](http://www.fws.gov/Nevada/desert_tortoise/documents/reports/2007_Rangewide_Desert_Tortoise_Population_Monitoring.pdf)

# Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities

State of California  
CALIFORNIA NATURAL RESOURCES AGENCY  
Department of Fish and Game  
November 24, 2009<sup>1</sup>

## INTRODUCTION AND PURPOSE

The conservation of special status native plants and their habitats, as well as natural communities, is integral to maintaining biological diversity. The purpose of these protocols is to facilitate a consistent and systematic approach to the survey and assessment of special status native plants and natural communities so that reliable information is produced and the potential of locating a special status plant species or natural community is maximized. They may also help those who prepare and review environmental documents determine when a botanical survey is needed, how field surveys may be conducted, what information to include in a survey report, and what qualifications to consider for surveyors. The protocols may help avoid delays caused when inadequate biological information is provided during the environmental review process; assist lead, trustee and responsible reviewing agencies to make an informed decision regarding the direct, indirect, and cumulative effects of a proposed development, activity, or action on special status native plants and natural communities; meet California Environmental Quality Act (CEQA)<sup>2</sup> requirements for adequate disclosure of potential impacts; and conserve public trust resources.

## DEPARTMENT OF FISH AND GAME TRUSTEE AND RESPONSIBLE AGENCY MISSION

The mission of the Department of Fish and Game (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 (Fish and Game Code §1802). DFG, as trustee agency under CEQA §15386, provides expertise in reviewing and commenting on environmental documents and makes protocols regarding potential negative impacts to those resources held in trust for the people of California.

Certain species are in danger of extinction because their habitats have been severely reduced in acreage, are threatened with destruction or adverse modification, or because of a combination of these and other factors. The California Endangered Species Act (CESA) provides additional protections for such species, including take prohibitions (Fish and Game Code §2050 *et seq.*). As a responsible agency, DFG has the authority to issue permits for the take of species listed under CESA if the take is incidental to an otherwise lawful activity; DFG has determined that the impacts of the take have been minimized and fully mitigated; and, the take would not jeopardize the continued existence of the species (Fish and Game Code §2081). Surveys are one of the preliminary steps to detect a listed or special status plant species or natural community that may be impacted significantly by a project.

## DEFINITIONS

Botanical surveys provide information used to determine the potential environmental effects of proposed projects on all special status plants and natural communities as required by law (i.e., CEQA, CESA, and Federal Endangered Species Act (ESA)). Some key terms in this document appear in **bold font** for assistance in use of the document.

For the purposes of this document, **special status plants** include all plant species that meet one or more of the following criteria<sup>3</sup>:

<sup>1</sup> This document replaces the DFG document entitled "Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened and Endangered Plants and Natural Communities."

<sup>2</sup> <http://ceres.ca.gov/ceqa/>

<sup>3</sup> Adapted from the East Alameda County Conservation Strategy available at [http://www.fws.gov/sacramento/EACCS/Documents/080228\\_Species\\_Evaluation\\_EACCS.pdf](http://www.fws.gov/sacramento/EACCS/Documents/080228_Species_Evaluation_EACCS.pdf)

- Listed or proposed for listing as threatened or endangered under ESA or candidates for possible future listing as threatened or endangered under the ESA (50 CFR §17.12).
- Listed<sup>4</sup> or candidates for listing by the State of California as threatened or endangered under CESA (Fish and Game Code §2050 *et seq.*). A species, subspecies, or variety of plant is **endangered** when the prospects of its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, over-exploitation, predation, competition, disease, or other factors (Fish and Game Code §2062). A plant is **threatened** when it is likely to become endangered in the foreseeable future in the absence of special protection and management measures (Fish and Game Code §2067).
- Listed as rare under the California Native Plant Protection Act (Fish and Game Code §1900 *et seq.*). A plant is **rare** when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens (Fish and Game Code §1901).
- Meet the definition of rare or endangered under CEQA §15380(b) and (d). Species that may meet the definition of rare or endangered include the following:
  - ♦ Species considered by the California Native Plant Society (CNPS) to be “rare, threatened or endangered in California” (Lists 1A, 1B and 2);
  - ♦ Species that may warrant consideration on the basis of local significance or recent biological information<sup>5</sup>;
  - ♦ Some species included on the California Natural Diversity Database’s (CNDDDB) *Special Plants, Bryophytes, and Lichens List* (California Department of Fish and Game 2008)<sup>6</sup>.
- Considered a **locally significant species**, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region (CEQA §15125 (c)) or is so designated in local or regional plans, policies, or ordinances (CEQA Guidelines, Appendix G). Examples include a species at the outer limits of its known range or a species occurring on an uncommon soil type.

**Special status natural communities** are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. These communities may or may not contain special status species or their habitat. The most current version of the Department’s *List of California Terrestrial Natural Communities*<sup>7</sup> indicates which natural communities are of special status given the current state of the California classification.

Most types of wetlands and riparian communities are considered special status natural communities due to their limited distribution in California. These natural communities often contain special status plants such as those described above. These protocols may be used in conjunction with protocols formulated by other agencies, for example, those developed by the U.S. Army Corps of Engineers to delineate jurisdictional wetlands<sup>8</sup> or by the U.S. Fish and Wildlife Service to survey for the presence of special status plants<sup>9</sup>.

<sup>4</sup> Refer to current online published lists available at: <http://www.dfg.ca.gov/biogeodata>.

<sup>5</sup> In general, CNPS List 3 plants (plants about which more information is needed) and List 4 plants (plants of limited distribution) may not warrant consideration under CEQA §15380. These plants may be included on special status plant lists such as those developed by counties where they would be addressed under CEQA §15380. List 3 plants may be analyzed under CEQA §15380 if sufficient information is available to assess potential impacts to such plants. Factors such as regional rarity vs. statewide rarity should be considered in determining whether cumulative impacts to a List 4 plant are significant even if individual project impacts are not. List 3 and 4 plants are also included in the California Natural Diversity Database’s (CNDDDB) *Special Plants, Bryophytes, and Lichens List*. [Refer to the current online published list available at: <http://www.dfg.ca.gov/biogeodata>.] Data on Lists 3 and 4 plants should be submitted to CNDDDB. Such data aids in determining or revising priority ranking.

<sup>6</sup> Refer to current online published lists available at: <http://www.dfg.ca.gov/biogeodata>.

<sup>7</sup> <http://www.dfg.ca.gov/biogeodata/vegcamp/pdfs/natcomlist.pdf>. The rare natural communities are asterisked on this list.

<sup>8</sup> <http://www.wetlands.com/regs/tlpg02e.htm>

<sup>9</sup> U.S. Fish and Wildlife Service Survey Guidelines available at <http://www.fws.gov/sacramento/es/protocol.htm>

## BOTANICAL SURVEYS

Conduct botanical surveys prior to the commencement of any activities that may modify vegetation, such as clearing, mowing, or ground-breaking activities. It is appropriate to conduct a botanical field survey when:

- Natural (or naturalized) vegetation occurs on the site, and it is unknown if special status plant species or natural communities occur on the site, and the project has the potential for direct or indirect effects on vegetation; or
- Special status plants or natural communities have historically been identified on the project site; or
- Special status plants or natural communities occur on sites with similar physical and biological properties as the project site.

### SURVEY OBJECTIVES

Conduct field surveys in a manner which maximizes the likelihood of locating special status plant species or special status natural communities that may be present. Surveys should be **floristic in nature**, meaning that every plant taxon that occurs on site is identified to the taxonomic level necessary to determine rarity and listing status. "Focused surveys" that are limited to habitats known to support special status species or are restricted to lists of likely potential species are not considered floristic in nature and are not adequate to identify all plant taxa on site to the level necessary to determine rarity and listing status. Include a list of plants and natural communities detected on the site for each botanical survey conducted. More than one field visit may be necessary to adequately capture the floristic diversity of a site. An indication of the prevalence (estimated total numbers, percent cover, density, etc.) of the species and communities on the site is also useful to assess the significance of a particular population.

### SURVEY PREPARATION

Before field surveys are conducted, compile relevant botanical information in the general project area to provide a regional context for the investigators. Consult the CNDDDB<sup>10</sup> and BIOS<sup>11</sup> for known occurrences of special status plants and natural communities in the project area prior to field surveys. Generally, identify vegetation and habitat types potentially occurring in the project area based on biological and physical properties of the site and surrounding ecoregion<sup>12</sup>, unless a larger assessment area is appropriate. Then, develop a list of special status plants with the potential to occur within these vegetation types. This list can serve as a tool for the investigators and facilitate the use of reference sites; however, special status plants on site might not be limited to those on the list. Field surveys and subsequent reporting should be comprehensive and floristic in nature and not restricted to or focused only on this list. Include in the survey report the list of potential special status species and natural communities, and the list of references used to compile the background botanical information for the site.

### SURVEY EXTENT

Surveys should be comprehensive over the entire site, including areas that will be directly or indirectly impacted by the project. Adjoining properties should also be surveyed where direct or indirect project effects, such as those from fuel modification or herbicide application, could potentially extend offsite. Pre-project surveys restricted to known CNDDDB rare plant locations may not identify all special status plants and communities present and do not provide a sufficient level of information to determine potential impacts.

### FIELD SURVEY METHOD

Conduct surveys using **systematic field techniques** in all habitats of the site to ensure thorough coverage of potential impact areas. The level of effort required per given area and habitat is dependent upon the vegetation and its overall diversity and structural complexity, which determines the distance at which plants can be identified. Conduct surveys by walking over the entire site to ensure thorough coverage, noting all plant taxa

<sup>10</sup> Available at <http://www.dfg.ca.gov/biogeodata/cndddb>

<sup>11</sup> <http://www.bios.dfg.ca.gov/>

<sup>12</sup> [Ecological Subregions of California](http://www.fs.fed.us/r5/projects/ecoregions/toc.htm), available at <http://www.fs.fed.us/r5/projects/ecoregions/toc.htm>

observed. The level of effort should be sufficient to provide comprehensive reporting. For example, one person-hour per eight acres per survey date is needed for a comprehensive field survey in grassland with medium diversity and moderate terrain<sup>13</sup>, with additional time allocated for species identification.

## TIMING AND NUMBER OF VISITS

Conduct surveys in the field at the time of year when species are both evident and identifiable. Usually this is during flowering or fruiting. Space visits throughout the growing season to accurately determine what plants exist on site. Many times this may involve multiple visits to the same site (e.g. in early, mid, and late-season for flowering plants) to capture the floristic diversity at a level necessary to determine if special status plants are present<sup>14</sup>. The timing and number of visits are determined by geographic location, the natural communities present, and the weather patterns of the year(s) in which the surveys are conducted.

## REFERENCE SITES

When special status plants are known to occur in the type(s) of habitat present in the project area, observe reference sites (nearby accessible occurrences of the plants) to determine whether those species are identifiable at the time of the survey and to obtain a visual image of the target species, associated habitat, and associated natural community.

## USE OF EXISTING SURVEYS

For some sites, floristic inventories or special status plant surveys may already exist. Additional surveys may be necessary for the following reasons:

- Surveys are not current<sup>15</sup>; or
- Surveys were conducted in natural systems that commonly experience year to year fluctuations such as periods of drought or flooding (e.g. vernal pool habitats or riverine systems); or
- Surveys are not comprehensive in nature; or fire history, land use, physical conditions of the site, or climatic conditions have changed since the last survey was conducted<sup>16</sup>; or
- Surveys were conducted in natural systems where special status plants may not be observed if an annual above ground phase is not visible (e.g. flowers from a bulb); or
- Changes in vegetation or species distribution may have occurred since the last survey was conducted, due to habitat alteration, fluctuations in species abundance and/or seed bank dynamics.

## NEGATIVE SURVEYS

Adverse conditions may prevent investigators from determining the presence of, or accurately identifying, some species in potential habitat of target species. Disease, drought, predation, or herbivory may preclude the presence or identification of target species in any given year. Discuss such conditions in the report.

The failure to locate a known special status plant occurrence during one field season does not constitute evidence that this plant occurrence no longer exists at this location, particularly if adverse conditions are present. For example, surveys over a number of years may be necessary if the species is an annual plant having a persistent, long-lived seed bank and is known not to germinate every year. Visits to the site in more

<sup>13</sup> Adapted from U.S. Fish and Wildlife Service kit fox survey guidelines available at [www.fws.gov/sacramento/es/documents/kitfox\\_no\\_protocol.pdf](http://www.fws.gov/sacramento/es/documents/kitfox_no_protocol.pdf)

<sup>14</sup> U.S. Fish and Wildlife Service Survey Guidelines available at <http://www.fws.gov/sacramento/es/protocol.htm>

<sup>15</sup> Habitats, such as grasslands or desert plant communities that have annual and short-lived perennial plants as major floristic components may require yearly surveys to accurately document baseline conditions for purposes of impact assessment. In forested areas, however, surveys at intervals of five years may adequately represent current conditions. For forested areas, refer to "Guidelines for Conservation of Sensitive Plant Resources Within the Timber Harvest Review Process and During Timber Harvesting Operations", available at <https://r1.dfg.ca.gov/portal/Portals/12/THPBotanicalGuidelinesJuly2005.pdf>

<sup>16</sup> U.S. Fish and Wildlife Service Survey Guidelines available at [http://www.fws.gov/ventura/speciesinfo/protocols\\_guidelines/docs/botanicalinventories.pdf](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/botanicalinventories.pdf)

than one year increase the likelihood of detection of a special status plant especially if conditions change. To further substantiate negative findings for a known occurrence, a visit to a nearby reference site may ensure that the timing of the survey was appropriate.

## REPORTING AND DATA COLLECTION

Adequate information about special status plants and natural communities present in a project area will enable reviewing agencies and the public to effectively assess potential impacts to special status plants or natural communities<sup>17</sup> and will guide the development of minimization and mitigation measures. The next section describes necessary information to assess impacts. For comprehensive, systematic surveys where no special status species or natural communities were found, reporting and data collection responsibilities for investigators remain as described below, excluding specific occurrence information.

### SPECIAL STATUS PLANT OR NATURAL COMMUNITY OBSERVATIONS

Record the following information for locations of each special status plant or natural community detected during a field survey of a project site.

- A detailed map (1:24,000 or larger) showing locations and boundaries of each special status species occurrence or natural community found as related to the proposed project. Mark occurrences and boundaries as accurately as possible. Locations documented by use of global positioning system (GPS) coordinates must include the datum<sup>18</sup> in which they were collected;
- The site-specific characteristics of occurrences, such as associated species, habitat and microhabitat, structure of vegetation, topographic features, soil type, texture, and soil parent material. If the species is associated with a wetland, provide a description of the direction of flow and integrity of surface or subsurface hydrology and adjacent off-site hydrological influences as appropriate;
- The number of individuals in each special status plant population as counted (if population is small) or estimated (if population is large);
- If applicable, information about the percentage of individuals in each life stage such as seedlings vs. reproductive individuals;
- The number of individuals of the species per unit area, identifying areas of relatively high, medium and low density of the species over the project site; and
- Digital images of the target species and representative habitats to support information and descriptions.

### FIELD SURVEY FORMS

When a special status plant or natural community is located, complete and submit to the CNDDDB a California Native Species (or Community) Field Survey Form<sup>19</sup> or equivalent written report, accompanied by a copy of the relevant portion of a 7.5 minute topographic map with the occurrence mapped. Present locations documented by use of GPS coordinates in map and digital form. Data submitted in digital form must include the datum<sup>20</sup> in which it was collected. If a potentially undescribed special status natural community is found on the site, document it with a Rapid Assessment or Relevé form<sup>21</sup> and submit it with the CNDDDB form.

### VOUCHER COLLECTION

Voucher specimens provide verifiable documentation of species presence and identification as well as a public record of conditions. This information is vital to all conservation efforts. Collection of voucher specimens

<sup>17</sup> Refer to current online published lists available at: <http://www.dfg.ca.gov/biogeodata>. For Timber Harvest Plans (THPs) please refer to the "Guidelines for Conservation of Sensitive Plant Resources Within the Timber Harvest Review Process and During Timber Harvesting Operations", available at <https://r1.dfg.ca.gov/portal/Portals/12/THPBotanicalGuidelinesJuly2005.pdf>

<sup>18</sup> NAD83, NAD27 or WGS84

<sup>19</sup> <http://www.dfg.ca.gov/biogeodata>

<sup>20</sup> NAD83, NAD27 or WGS84

<sup>21</sup> [http://www.dfg.ca.gov/biogeodata/vegcamp/veg\\_publications\\_protocols.asp](http://www.dfg.ca.gov/biogeodata/vegcamp/veg_publications_protocols.asp)

should be conducted in a manner that is consistent with conservation ethics, and is in accordance with applicable state and federal permit requirements (e.g. incidental take permit, scientific collection permit). Voucher collections of special status species (or suspected special status species) should be made only when such actions would not jeopardize the continued existence of the population or species.

Deposit voucher specimens with an indexed regional herbarium<sup>22</sup> no later than 60 days after the collections have been made. Digital imagery can be used to supplement plant identification and document habitat. Record all relevant permittee names and permit numbers on specimen labels. A collecting permit is required prior to the collection of State-listed plant species<sup>23</sup>.

## **BOTANICAL SURVEY REPORTS**

Include reports of botanical field surveys containing the following information with project environmental documents:

- **Project and site description**
  - ♦ A description of the proposed project;
  - ♦ A detailed map of the project location and study area that identifies topographic and landscape features and includes a north arrow and bar scale; and,
  - ♦ A written description of the biological setting, including vegetation<sup>24</sup> and structure of the vegetation; geological and hydrological characteristics; and land use or management history.
- **Detailed description of survey methodology and results**
  - ♦ Dates of field surveys (indicating which areas were surveyed on which dates), name of field investigator(s), and total person-hours spent on field surveys;
  - ♦ A discussion of how the timing of the surveys affects the comprehensiveness of the survey;
  - ♦ A list of potential special status species or natural communities;
  - ♦ A description of the area surveyed relative to the project area;
  - ♦ References cited, persons contacted, and herbaria visited;
  - ♦ Description of reference site(s), if visited, and phenological development of special status plant(s);
  - ♦ A list of all taxa occurring on the project site. Identify plants to the taxonomic level necessary to determine whether or not they are a special status species;
  - ♦ Any use of existing surveys and a discussion of applicability to this project;
  - ♦ A discussion of the potential for a false negative survey;
  - ♦ Provide detailed data and maps for all special plants detected. Information specified above under the headings "Special Status Plant or Natural Community Observations," and "Field Survey Forms," should be provided for locations of each special status plant detected;
  - ♦ Copies of all California Native Species Field Survey Forms or Natural Community Field Survey Forms should be sent to the CNDDDB and included in the environmental document as an Appendix. It is not necessary to submit entire environmental documents to the CNDDDB; and,
  - ♦ The location of voucher specimens, if collected.
- **Assessment of potential impacts**

<sup>22</sup> For a complete list of indexed herbaria, see: Holmgren, P., N. Holmgren and L. Barnett. 1990. Index Herbariorum, Part 1: Herbaria of the World. New York Botanic Garden, Bronx, New York. 693 pp. Or: <http://www.nybg.org/bsci/ih/ih.html>

<sup>23</sup> Refer to current online published lists available at: <http://www.dfg.ca.gov/biogeodata>.

<sup>24</sup> A vegetation map that uses the National Vegetation Classification System (<http://biology.usgs.gov/npsveg/nvcs.html>), for example *A Manual of California Vegetation*, and highlights any special status natural communities. If another vegetation classification system is used, the report should reference the system, provide the reason for its use, and provide a crosswalk to the National Vegetation Classification System.

- ♦ A discussion of the significance of special status plant populations in the project area considering nearby populations and total species distribution;
- ♦ A discussion of the significance of special status natural communities in the project area considering nearby occurrences and natural community distribution;
- ♦ A discussion of direct, indirect, and cumulative impacts to the plants and natural communities;
- ♦ A discussion of threats, including those from invasive species, to the plants and natural communities;
- ♦ A discussion of the degree of impact, if any, of the proposed project on unoccupied, potential habitat of the species;
- ♦ A discussion of the immediacy of potential impacts; and,
- ♦ Recommended measures to avoid, minimize, or mitigate impacts.

### **QUALIFICATIONS**

Botanical consultants should possess the following qualifications:

- Knowledge of plant taxonomy and natural community ecology;
- Familiarity with the plants of the area, including special status species;
- Familiarity with natural communities of the area, including special status natural communities;
- Experience conducting floristic field surveys or experience with floristic surveys conducted under the direction of an experienced surveyor;
- Familiarity with the appropriate state and federal statutes related to plants and plant collecting; and,
- Experience with analyzing impacts of development on native plant species and natural communities.

### **SUGGESTED REFERENCES**

- Barbour, M., T. Keeler-Wolf, and A. A. Schoenherr (eds.). 2007. *Terrestrial vegetation of California* (3rd Edition). University of California Press.
- Bonham, C.D. 1988. *Measurements for terrestrial vegetation*. John Wiley and Sons, Inc., New York, NY.
- California Native Plant Society. Most recent version. *Inventory of rare and endangered plants* (online edition). California Native Plant Society, Sacramento, CA. Online URL <http://www.cnps.org/inventory>.
- California Natural Diversity Database. Most recent version. *Special vascular plants, bryophytes and lichens list*. Updated quarterly. Available at [www.dfg.ca.gov](http://www.dfg.ca.gov).
- Elzinga, C.L., D.W. Salzer, and J. Willoughby. 1998. *Measuring and monitoring plant populations*. BLM Technical Reference 1730-1. U.S. Dept. of the Interior, Bureau of Land Management, Denver, Colorado.
- Leppig, G. and J.W. White. 2006. *Conservation of peripheral plant populations in California*. *Madroño* 53:264-274.
- Mueller-Dombois, D. and H. Ellenberg. 1974. *Aims and methods of vegetation ecology*. John Wiley and Sons, Inc., New York, NY.
- U.S. Fish and Wildlife Service. 1996. *Guidelines for conducting and reporting botanical inventories for federally listed plants on the Santa Rosa Plain*. Sacramento, CA.
- U.S. Fish and Wildlife Service. 1996. *Guidelines for conducting and reporting botanical inventories for federally listed, proposed and candidate plants*. Sacramento, CA.
- Van der Maarel, E. 2005. *Vegetation Ecology*. Blackwell Science Ltd., Malden, MA.



# Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities

State of California  
THE RESOURCES AGENCY  
Department of Fish and Game  
December 9, 1983  
Revised May 8, 2000

The following recommendations are intended to help those who prepare and review environmental documents determine **when** a botanical survey is needed, **who** should be considered qualified to conduct such surveys, **how** field surveys should be conducted, and **what** information should be contained in the survey report. The Department may recommend that lead agencies not accept the results of surveys that are not conducted according to these guidelines.

1. Botanical surveys are conducted in order to determine the environmental effects of proposed projects on all rare, threatened, and endangered plants and plant communities. Rare, threatened, and endangered plants are not necessarily limited to those species which have been "listed" by state and federal agencies but should include any species that, based on all available data, can be shown to be rare, threatened, and/or endangered under the following definitions:

A species, subspecies, or variety of plant is "endangered" when the prospects of its survival and reproduction are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, over-exploitation, predation, competition, or disease. A plant is "threatened" when it is likely to become endangered in the foreseeable future in the absence of protection measures. A plant is "rare" when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens.

Rare natural communities are those communities that are of highly limited distribution. These communities may or may not contain rare, threatened, or endangered species. The most current version of the California Natural Diversity Database's List of California Terrestrial Natural Communities may be used as a guide to the names and status of communities.

2. It is appropriate to conduct a botanical field survey to determine if, or to the extent that, rare, threatened, or endangered plants will be affected by a proposed project when:

- a. Natural vegetation occurs on the site, it is unknown if rare, threatened, or endangered plants or habitats occur on the site, and the project has the potential for direct or indirect effects on vegetation; or
- b. Rare plants have historically been identified on the project site, but adequate information for impact assessment is lacking.

3. Botanical consultants should possess the following qualifications:

- a. Experience conducting floristic field surveys;
- b. Knowledge of plant taxonomy and plant community ecology;
- c. Familiarity with the plants of the area, including rare, threatened, and endangered species;
- d. Familiarity with the appropriate state and federal statutes related to plants and plant collecting; and,
- e. Experience with analyzing impacts of development on native plant species and communities.

4. Field surveys should be conducted in a manner that will locate any rare, threatened, or endangered species that may be present. Specifically, rare, threatened, or endangered plant surveys should be:

- a. Conducted in the field at the proper time of year when rare, threatened, or endangered species are both evident and identifiable. Usually, this is when the plants are flowering.

When rare, threatened, or endangered plants are known to occur in the type(s) of habitat present in the project

area, nearby accessible occurrences of the plants (reference sites) should be observed to determine that the species are identifiable at the time of the survey.

b. Floristic in nature. A floristic survey requires that every plant observed be identified to the extent necessary to determine its rarity and listing status. In addition, a sufficient number of visits spaced throughout the growing season are necessary to accurately determine what plants exist on the site. In order to properly characterize the site and document the completeness of the survey, a complete list of plants observed on the site should be included in every botanical survey report.

c. Conducted in a manner that is consistent with conservation ethics. Collections (voucher specimens) of rare, threatened, or endangered species, or suspected rare, threatened, or endangered species should be made only when such actions would not jeopardize the continued existence of the population and in accordance with applicable state and federal permit requirements. A collecting permit from the Habitat Conservation Planning Branch of DFG is required for collection of state-listed plant species. Voucher specimens should be deposited at recognized public herbaria for future reference. Photography should be used to document plant identification and habitat whenever possible, but especially when the population cannot withstand collection of voucher specimens.

d. Conducted using systematic field techniques in all habitats of the site to ensure a thorough coverage of potential impact areas.

e. Well documented. When a rare, threatened, or endangered plant (or rare plant community) is located, a California Native Species (or Community) Field Survey Form or equivalent written form, accompanied by a copy of the appropriate portion of a 7.5 minute topographic map with the occurrence mapped, should be completed and submitted to the Natural Diversity Database. Locations may be best documented using global positioning systems (GPS) and presented in map and digital forms as these tools become more accessible.

5. Reports of botanical field surveys should be included in or with environmental assessments, negative declarations and mitigated negative declarations, Timber Harvesting Plans (THPs), EIR's, and EIS's, and should contain the following information:

- a. Project description, including a detailed map of the project location and study area.
- b. A written description of biological setting referencing the community nomenclature used and a vegetation map.
- c. Detailed description of survey methodology.
- d. Dates of field surveys and total person-hours spent on field surveys.
- e. Results of field survey including detailed maps and specific location data for each plant population found. Investigators are encouraged to provide GPS data and maps documenting population boundaries.
- f. An assessment of potential impacts. This should include a map showing the distribution of plants in relation to proposed activities.
- g. Discussion of the significance of rare, threatened, or endangered plant populations in the project area considering nearby populations and total species distribution.
- h. Recommended measures to avoid impacts.
- i. A list of all plants observed on the project area. Plants should be identified to the taxonomic level necessary to determine whether or not they are rare, threatened or endangered.
- j. Description of reference site(s) visited and phenological development of rare, threatened, or endangered plant(s).
- k. Copies of all California Native Species Field Survey Forms or Natural Community Field Survey Forms.
- l. Name of field investigator(s).
- m. References cited, persons contacted, herbaria visited, and the location of voucher specimens.

Mail to:  
 California Natural Diversity Database  
 Department of Fish and Game  
 1807 13<sup>th</sup> Street, Suite 202  
 Sacramento, CA 95814  
 Fax: (916) 324-0475 email: CNDDDB@dfg.ca.gov

For Office Use Only	
Source Code _____	Quad Code _____
Elm Code _____	Occ. No. _____
EO Index No. _____	Map Index No. _____

Date of Field Work (mm/dd/yyyy): \_\_\_\_\_

**Reset**

## California Native Species Field Survey Form

**Send Form**

**Scientific Name:** \_\_\_\_\_

**Common Name:** \_\_\_\_\_

**Species Found?**  Yes  No \_\_\_\_\_ If not, why? \_\_\_\_\_

Total No. Individuals \_\_\_\_\_ Subsequent Visit?  yes  no

Is this an existing NDDDB occurrence?  no  unk. Yes, Occ. # \_\_\_\_\_

Collection? If yes: \_\_\_\_\_  
 Number \_\_\_\_\_ Museum / Herbarium \_\_\_\_\_

**Reporter:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**E-mail Address:** \_\_\_\_\_

**Phone:** \_\_\_\_\_

**Plant Information**

Phenology: \_\_\_\_\_% vegetative \_\_\_\_\_% flowering \_\_\_\_\_% fruiting

**Animal Information**

# adults	# juveniles	# larvae	# egg masses	# unknown
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
breeding	wintering	burrow site	rookery	nesting
				other

**Location Description (please attach map AND/OR fill out your choice of coordinates, below)**

County: \_\_\_\_\_ Landowner / Mgr.: \_\_\_\_\_

Quad Name: \_\_\_\_\_ Elevation: \_\_\_\_\_

T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ ¼ of \_\_\_\_\_ ¼, Meridian: H  M  S  Source of Coordinates (GPS, topo. map & type): \_\_\_\_\_

T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ ¼ of \_\_\_\_\_ ¼, Meridian: H  M  S  GPS Make & Model \_\_\_\_\_

**DATUM:** NAD27  NAD83  WGS84  Horizontal Accuracy \_\_\_\_\_ meters/feet

Coordinate System: UTM Zone 10  UTM Zone 11  OR Geographic (Latitude & Longitude)

Coordinates: \_\_\_\_\_

**Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):**

Other rare taxa seen at THIS site on THIS date:  
 (separate form preferred)

**Site Information** Overall site/occurrence quality/viability (site + population):  Excellent  Good  Fair  Poor

Immediate AND surrounding land use: \_\_\_\_\_

Visible disturbances: \_\_\_\_\_

Threats: \_\_\_\_\_

Comments: \_\_\_\_\_

**Determination:** (check one or more, and fill in blanks)

Keyed (cite reference): \_\_\_\_\_

Compared with specimen housed at: \_\_\_\_\_

Compared with photo / drawing in: \_\_\_\_\_

By another person (name): \_\_\_\_\_

Other: \_\_\_\_\_

**Photographs:** (check one or more)

Plant / animal	Slide <input type="checkbox"/>	Print <input type="checkbox"/>	Digital <input type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes  no



## General Instructions for Filling Out California Natural Diversity Database Field Survey Forms

The California Natural Diversity Database (CNDDDB) is the largest, most comprehensive database of its type in the world. It presently contains almost 40,000 site-specific records on California's rarest plants, animals, and natural communities. The majority of the data collection effort for this has been provided by an exceptional assemblage of biologists throughout the state and the west. The backbone of this effort is the field survey form.

Although the future lies in the digitally submittible field form and map, this system is not yet in place. Enclosed are copies of CNDDDB paper field survey forms for species and natural communities. The CNDDDB would appreciate your field observations on rare, threatened, endangered, or sensitive species and natural communities (elements) submitted to us on these forms.

To determine what species and natural communities are of concern to us, refer to our free publications for lists of which elements these include: *Special Vascular Plants, Bryophytes, and Lichens List*, *Special Animals List*, and *Natural Communities List*. Reports on multiple visits to sites that already exist in the CNDDDB are as important as new site information as is it helps us track trends in population/stand size and condition. Naturally, new site information is also welcomed.

Enclosed is an example of a field survey form that includes the information we like to see. Note that you may either submit a copied portion of a USGS topographic quad map with the population/stand outlined or marked (see back of enclosed example), or provide a set of coordinates (GPS coordinates, TRS information, or other). You do not have to submit all of this information; just one will suffice, and generally the best choice is to submit a map. Furthermore, you do not have to fill out every box on the form; just fill out what seems relevant to your site visit. Remember that your name and telephone number and/or email are very important in case we have any questions about the form.

If you are concerned about the sensitivity of the site, remember that the CNDDDB can label your element occurrence "Sensitive" in the database, thus restricting access to that information.

The CNDDDB is only as good as the information in it, and we depend on people like you as the source of that information. Thank you for your help in improving the CNDDDB.

Please see also, [Instructions for Collecting Information with Global Positioning Systems for the California Natural Diversity Database](#).

Mail to:  
 California Natural Diversity Database  
 Department of Fish and Game  
 1807 13<sup>th</sup> Street, Suite 202  
 Sacramento, CA 95814  
 Fax: (916) 324-0475

*For Office Use Only*

Source Code \_\_\_\_\_ Quad Code \_\_\_\_\_  
 Elm Code \_\_\_\_\_ Occ. No. \_\_\_\_\_  
 EO Index No. \_\_\_\_\_ Map Index No. \_\_\_\_\_

Date of Field Work: 8 - 10 - 2000

**Reset**

## California Native Species Field Survey Form

**Send Form**

**Scientific Name:** *Lupinus padre-crowleyi*

**Common Name:** Father Crowley's lupine

**Species Found?**  Yes  No If not, why?

Total No. Individuals \*10 Subsequent Visit?  yes  no  
**Is this an existing NDDB occurrence?** 8  no  unk.  
Yes, Occ. #

Collection? If yes: \_\_\_\_\_  
Number Museum / Herbarium

**Reporter:** Your Name Here

**Address:** Your Organization and Address Here  
Your Town, State Zipcode Here

**E-mail Address:** youremail@here

**Phone:** (000) 000-0000

**Plant Information**

Phenology: \_\_\_\_\_% vegetative 100% flowering \_\_\_\_\_% fruiting

**Animal Information**

# adults	# juveniles	# larvae	# egg masses	# unknown
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
breeding	wintering	burrow site	rookery	nesting
				other

**Location Description (please attach map AND/OR fill out your choice of coordinates, below)**

Along Shepherd Pass trail, between the first and second saddles above the main switchbacks from Symmes Creek to the top of the ridge, as the trail levels out and begins to drop down towards Shepherd Creek drainage. \*\*See Comments, below.

County: Inyo Landowner / Mgr.: USDA, Inyo National Forest

Quad Name: Mount Williamson, CA Elevation: 9081 ft.

T 14S R 34E Sec 20, NW ¼ of NE ¼, Meridian:  H  M  S  Source of Coordinates (GPS, topo. map & type): GPS

T \_\_\_\_\_ R \_\_\_\_\_ Sec \_\_\_\_\_, \_\_\_\_\_ ¼ of \_\_\_\_\_ ¼, Meridian:  H  M  S  GPS Make & Model Garmin 12

Datum:  NAD27  NAD83  WGS84  Horizontal Accuracy 3-5 meters \_\_\_\_\_ meters/feet

Coordinate System: UTM Zone 10  UTM Zone 11  OR Geographic (Latitude & Longitude)

Coordinates: Easting/Longitude E383883.83 Northing/Latitude N4063216.65

**Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):**

Moderately steep, east facing slope; sandy granitic soil; sagebrush scrub: *Artemisia tridentata*, *Eriogonum umbellatum*, *Arctostaphylos patula*, *Symphoricarpos* sp., *Angelica lineariloba*

Other rare species? None seen.

**Site Information** Overall site quality:  Excellent  Good  Fair  Poor

Current / surrounding land use: Wilderness; hiker trail passes adjacent to population

Visible disturbances: Trail work could potentially impact population; however, Inyo NF standards call for surveys prior to any ground disturbing activities.

Threats: \_\_\_\_\_

Comments: \*Population was located late in the day; no count was conducted, but <10 plants were visible from the trail, Further survey work needed.  
\*\*Going up the trail towards the pass, the plants are located above the trail, just before the 2 big Jeffrey pines below the trail

**Determination:** (check one or more, and fill in blanks)

Keyed (cite reference): \_\_\_\_\_

Compared with specimen housed at: UC herbarium

Compared with photo / drawing in: \_\_\_\_\_

By another person (name): \_\_\_\_\_

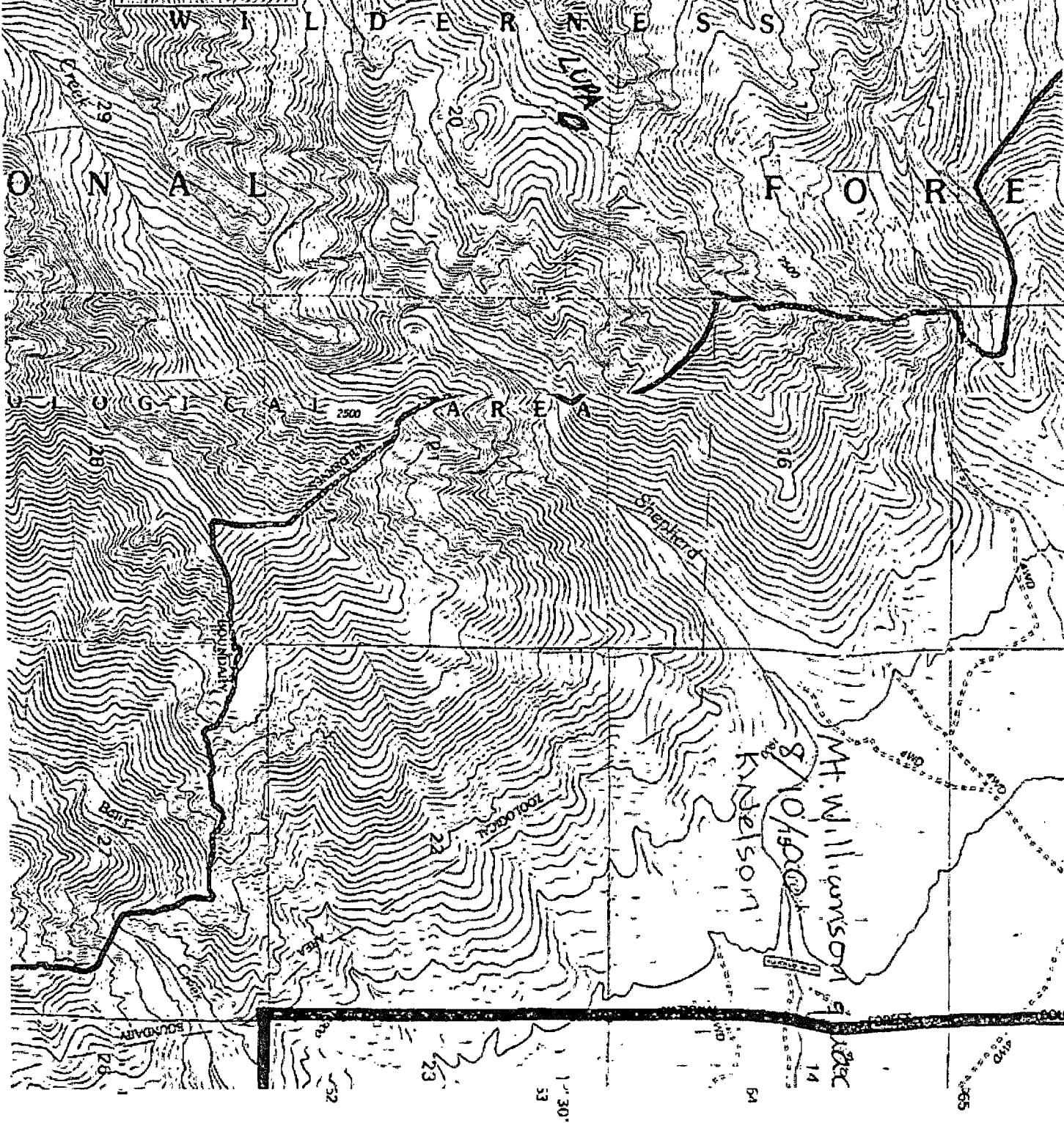
Other: \_\_\_\_\_

**Photographs:** (check one or more)

Plant / animal	Slide	Print	Digital
Habitat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense?  yes  no

Sample map  
submitted with  
CNDDDB Field  
Survey Form





## Instructions for Collecting Information with Global Positioning Systems for the California Natural Diversity Database

Data collected with Global Positioning Systems (GPS) are welcomed, but, cannot be used in our Geographic Information System (GIS) unless the **datum** and **coordinate system** are reported on the Field Survey form.

### CNDDB Preferred Settings

- Coordinate System: UTM (Universal Transverse Mercator) Projection; or if Geographic, Decimal Degrees
- Datum: NAD83 (North American Datum 1983)

### Definitions

Datum - defines the origin and orientation of the latitude and longitude lines. Common examples for North America are: NAD27, NAD83 and WGS84

Coordinate system - measurements that describe a position on the surface of the earth. Some examples are: *Universal Transverse Mercator (UTM) Zone, Easting and Northing*

Written Format: UTM Zone 10; 644886E, 4301511N

and *Geographic* - also referred to as Latitude and Longitude

Decimal Degrees (DDD.DDDDD°)

Written Format: Latitude: 32.30642; Longitude: -122.61458

### Recording GPS Information on the CNDDB California Native Species Field Survey Form

Horizontal Accuracy: This will be displayed on your GPS unit and is dependant on the number of satellite signals your unit is detecting.

- Example: 15 meters

### GPS Make and Model

- Example: Garmin 12XL

### Things to remember

- Record the datum and coordinates on the Field Observation Form.
- Try to obtain a GPS reading from satellites with as evenly distributed placement as possible (see your user manual).
- Acquire 3-Dimensional GPS location, if possible (4+ satellites).
- Receiving four signals in a canyon or under tree canopy may be difficult.
- Record location even if you are unable to acquire four (4) satellites.

### References

- Indiana Geographic Information Council, Standards and Recommendations. 2001. Projections, Datum, Coordinate Systems, and Units of Measure Standard. <http://www.in.gov/ingisi/metadata/index.html>
- Kelly, Maggi. 2002. California Oak Mortality Task Force Sudden Oak Death Monitoring Committee. [http://www.cnr.berkeley.edu/comtf/html/monitoring\\_committee.html](http://www.cnr.berkeley.edu/comtf/html/monitoring_committee.html)
- California Native Plant Society Vegetation Committee 2002. California Native Plant Society Relevé Protocol. <http://www.cnps.org/archives/forms/releve.pdf>
- Carnes, John. 2002. Map Tools. <http://www.maptools.com/>

# CNPS Botanical Survey Guidelines

CALIFORNIA NATIVE PLANT SOCIETY

December 9, 1983

Revised June 2, 2001

The following recommendations are intended to help those who prepare and review environmental documents determine when a botanical survey is needed, who should be considered qualified to conduct such surveys, how surveys should be conducted, and what information should be contained in the survey report. The California Native Plant Society recommends that lead agencies not accept the results of surveys unless they are conducted and reported according to these guidelines.

1. Botanical surveys are conducted in order to determine the environmental effects of proposed projects on all botanical resources, including special status plants (rare, threatened, and endangered plants) and plant (vegetation) communities. Special status plants are not limited to those that have been listed by state and federal agencies but include any plants that, based on all available data, can be shown to be rare, threatened, or endangered under the following definitions:

A species, subspecies, or variety of plant is "endangered" when the prospects of its survival and reproduction are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, over-exploitation, predation, competition, or disease. A plant is "threatened" when it is likely to become endangered in the foreseeable future in the absence of protection measures. A plant is "rare" when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens.<sup>1</sup>

Rare plant (vegetation) communities are those communities that are of highly limited distribution. These communities may or may not contain special status plants. The most current version of the California Natural Diversity Database's *List of California Terrestrial Natural Communities*<sup>2</sup> should be used as a guide to the names and status of communities.

Consistent with the California Native Plant Society's goal of preserving plant biodiversity on a regional and local scale, and with California Environmental Quality Act environmental impact assessment criteria<sup>3</sup>, surveys should also assess impacts to locally significant plants. Both plants and plant communities can be considered significant if their local occurrence is on the outer limits of known distribution, a range extension, a rediscovery, or rare or uncommon in a local context (such as within a county or region). Lead agencies should address impacts to these locally unique botanical resources regardless of their status elsewhere in the state.

2. Botanical surveys must be conducted to determine if, or to the extent that, special status or locally significant plants and plant communities will be affected by a proposed project when any natural vegetation occurs on the site and the project has the potential for direct or indirect effects on vegetation.
3. Those conducting botanical surveys must possess the following qualifications:
  - a. Experience conducting floristic field surveys;
  - b. Knowledge of plant taxonomy and plant community ecology and classification;
  - c. Familiarity with the plants of the area, including special status and locally significant plants;

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<sup>1</sup> California Environmental Quality Act Guidelines, §15065 and §15380.

<sup>2</sup> List of California Terrestrial Natural Communities. California Department of Fish and Game Natural Diversity Database. Sacramento, CA.

<sup>3</sup> California Environmental Quality Act Guidelines, Appendix G (Initial Study Environmental Checklist).



- d. Familiarity with the appropriate state and federal statutes related to plants and plant collecting; and,
  - e. Experience with analyzing impacts of a project on native plants and communities.
4. Botanical surveys should be conducted in a manner that will locate any special status or locally significant plants or plant communities that may be present. Specifically, botanical surveys should be:
- a. Conducted in the field at the proper times of year when special status and locally significant plants are both evident and identifiable. When special status plants are known to occur in the type(s) of habitat present in the project area, nearby accessible occurrences of the plants (reference sites) should be observed to determine that the plants are identifiable at the time of survey.
  - b. Floristic in nature. A floristic survey requires that every plant observed be identified to species, subspecies, or variety as applicable. In order to properly characterize the site, a complete list of plants observed on the site shall be included in every botanical survey report. In addition, a sufficient number of visits spaced throughout the growing season is necessary to prepare an accurate inventory of all plants that exist on the site. The number of visits and the timing between visits must be determined by geographic location, the plant communities present, and the weather patterns of the year(s) in which the surveys are conducted.
  - c. Conducted in a manner that is consistent with conservation ethics and accepted plant collection and documentation techniques<sup>4,5</sup>. Collections (voucher specimens) of special status and locally significant plants should be made, unless such actions would jeopardize the continued existence of the population. A single sheet should be collected and deposited at a recognized public herbarium for future reference. All collections shall be made in accordance with applicable state and federal permit requirements. Photography may be used to document plant identification only when the population cannot withstand collection of voucher specimens.
  - d. Conducted using systematic field techniques in all habitats of the site to ensure a thorough coverage of potential impact areas. All habitats within the project site must be surveyed thoroughly in order to properly inventory and document the plants present. The level of effort required per given area and habitat is dependent upon the vegetation and its overall diversity and structural complexity.
  - e. Well documented. When a special status plant (or rare plant community) is located, a California Native Species (or Community) Field Survey Form or equivalent written form, accompanied by a copy of the appropriate portion of a 7.5-minute topographic map with the occurrence mapped, shall be completed, included within the survey report, and separately submitted to the California Natural Diversity Database. Population boundaries should be mapped as accurately as possible. The number of individuals in each population should be counted or estimated, as appropriate.
5. Complete reports of botanical surveys shall be included with all environmental assessment documents, including Negative Declarations and Mitigated Negative Declarations, Timber Harvesting Plans, Environmental Impact Reports, and Environmental Impact Statements. Survey reports shall contain the following information:
- a. Project location and description, including:

<sup>4</sup> Collecting Guidelines and Documentation Techniques. California Native Plant Society Policy (adopted March 4, 1995).

<sup>5</sup> Ferren, W.R., Jr., D.L. Magney, and T.A. Sholars. 1995. The Future of California Floristics and Systematics: Collecting Guidelines and Documentation Techniques. *Madroño* 42(2):197-210.

- 1) A detailed map of the location and footprint of the proposed project.
  - 2) A detailed description of the proposed project, including one-time activities and ongoing activities that may affect botanical resources.
  - 3) A description of the general biological setting of the project area.
- b. Methods, including:
- 1) Survey methods for each of the habitats present, and rationale for the methods used.
  - 2) Description of reference site(s) visited and phenological development of the target special status plants, with an assessment of any conditions differing from the project site that may affect their identification.
  - 3) Dates of surveys and rationale for timing and intervals; names of personnel conducting the surveys; and total hours spent in the field for each surveyor on each date.
  - 4) Location of deposited voucher specimens and herbaria visited.
- c. Results, including:
- 1) A description and map of the vegetation communities on the project site. The current standard for vegetation classification, *A Manual of California Vegetation*<sup>6</sup>, should be used as a basis for the habitat descriptions and the vegetation map. If another vegetation classification system is used, the report must reference the system and provide the reason for its use.
  - 2) A description of the phenology of each of the plant communities at the time of each survey date.
  - 3) A list of all plants observed on the project site using accepted scientific nomenclature, along with any special status designation. The reference(s) used for scientific nomenclature shall be cited.
  - 4) Written description and detailed map(s) showing the location of each special status or locally significant plant found, the size of each population, and method used to estimate or census the population.
  - 5) Copies of all California Native Species Field Survey Forms or Natural Community Field Survey Forms and accompanying maps.
- d. Discussion, including:
- 1) Any factors that may have affected the results of the surveys (e.g., drought, human disturbance, recent fire).
  - 2) Discussion of any special local or range-wide significance of any plant population or community on the site.
  - 3) An assessment of potential impacts. This shall include a map showing the distribution of special status and locally significant plants and communities on the site in relation to the proposed activities. Direct, indirect, and cumulative impacts to the plants and communities shall be discussed.
  - 4) Recommended measures to avoid and/or minimize direct, indirect, and cumulative impacts.
- e. References cited and persons contacted.
- f. Qualifications of field personnel including any special experience with the habitats and special status plants present on the site.

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<sup>6</sup> Sawyer, J.O. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society. Sacramento, CA. 471 pp.

# California Native Plant Society

## COLLECTING GUIDELINES AND DOCUMENTATION TECHNIQUES - CNPS POLICY

Adopted 4 March 1995

**Problem Statement:** *Little or no botanical data are being gathered or supported by voucher collections on California's flora while more and more of California's botanical heritage is being lost to urban and agricultural development*

### Policy

**The California Native Plant Society recommends that voucher specimens be collected and stored appropriately to document floristic data included in environmental review projects and scientific studies, and that scientific documentation methods and needs should be included in academic curricula, as outlined in the following 14 recommendations.**

**Recommendation 1:** Environmental review projects (e.g., environmental impact reports [EIRs] and statements [EISs], environmental assessments [EAs], initial studies and negative declarations, natural environmental studies) that are conducted in the State of California and that include botanical field observations should also include voucher specimens, and/or photographic documentation consistent with existing standards, deposited in one or more herbaria listed in *Index Herbariorum, Ed. 8* (Holmgren et al. 1990) or subsequent editions.

**Recommendation 2:** The thoroughness of documentation for a particular project should be commensurate to the importance of the study, but in any case should include collection of voucher specimens for target species studies and noteworthy botanical observations (e.g., range extensions; state and county records; rediscoveries).

**Recommendation 3:** Clients (e.g., private or public permit applicants) for whom environmental studies are conducted should be held financially responsible for the collection, identification, and curation of botanical vouchers; otherwise, there is little chance that documentation will improve.

**Recommendation 4:** Collection of botanical vouchers and the deposition of them in formal herbaria should be a requirement of the CEQA and NEPA processes. CNPS recommends that the responsible agencies and legislative bodies undertake a review of state and federal legislation and make appropriate amendments that will result in the collection and preparation of botanical vouchers becoming a formal part of the environmental review process.

**Recommendation 5:** Preparation of botanical voucher specimens should be encouraged as an important part of the scientific process. Institutions and departments that support herbaria should develop policies regarding the deposition of vouchers by students, staff, and faculty. Support for herbaria should come not only from the host institution or department, but also from the users who deposit specimens. Agencies or corporations that fund research should be made aware of the importance of voucher specimens and should request that the preparation and curation of vouchers be included as a regular part of proposals and budgets.

**Recommendation 6:** Academic institutions should include in their curricula opportunities to expose students to the importance of scientific documentation and the need to prepare and preserve botanical and other biological voucher specimens. There is an urgent need to educate students in the importance and functions of systematics collections, whether these students anticipate a future in academic or applied science or want to be well-rounded citizens with understanding of experimental processes or California's natural resources.

**Recommendation 7:** Herbarium specimen collectors and label preparers should take every opportunity to include a wide range of hierarchical geographic and habitat data on specimen labels, consistent with





## COLLECTING GUIDELINES AND DOCUMENTATION TECHNIQUES - CNPS POLICY PAGE 2

existing standards, that will increase the usefulness of specimens and will make access to the information possible through computerization of label data.

**Recommendation 8:** One category of hierarchical data associated with herbarium specimens should be that which (1) identifies the project for which the specimen serves as a voucher, (2) lists the client, agency, and/or institution associated with the project, and (3) names the report in which the specimen is cited.

**Recommendation 9:** Investigate the feasibility of integrating voucher specimen label data with computerization efforts such as the Specimen Management System for California Herbaria (SMASCH) to provide mechanisms for biogeographical and floristic studies.

**Recommendation 10:** CNPS recommends that the Association of California Herbaria (ACH) should take an active role in organizing support for and preservation of California's herbaria.

**Recommendation 11:** The Association of California Herbaria, CNPS, and CBS should coordinate their activities toward (1) preservation of California's botanical heritage; (2) long-term support for California's botanical education and documentation centers; and (3) improved documentation of California's botanical resources through implementation of statewide policies regarding the collection, preparation, and curation of voucher specimens for academic and applied environmental and experimental botanical studies.

**Recommendation 12:** Local, state, and federal agencies should strengthen and expand (1) their requirements for documentation of environmental reports, particularly the requirement for voucher specimens; and (2) their relationship with academic institutions and organizations (e.g., ACH, CNPS, CBS) to assist with the professional documentation of environmental work and with the education of future agency staff and consultants; and (3) their support for herbaria that house voucher specimens, which document the botanical resources of public lands and which document the disclosures in reports required by the CEQA and NEPA processes.

**Recommendation 13:** Regulatory agencies and other responsible parties should consider developing a formal inter-relationship between (1) agencies or their consultants and (2) academic institutions or museums, whereby the institutions would provide for fee the botanical documentation portion of environmental reviews. Such an arrangement would reduce or eliminate any burden public agencies or private corporations might anticipate collecting and curating botanical voucher specimens, while insuring the collection and preservation of important specimens.

**Recommendation 14:** The academic institutions of California with botany programs and herbaria should continue and expand support for those programs and herbaria. The documentation and preservation of California's botanical heritage and the future of botanical research depend upon the education of scientists, resource managers, planners, and consultants who have strong backgrounds in professional botanical training.

### **Background**

At the workshop entitled "The Future of California Floristics and Systematics: Collecting Guidelines and Documentation Techniques" at the Jepson Symposium convened on 4 June 1994, 14 findings and recommendations were approved by the workshop participants (51 in attendance) covering four major areas of concern: (1) documentation of environmental analyses with herbarium voucher specimens, (2) documentation of experimental research with herbarium voucher specimens; (3) presentation of hierarchical data on specimen labels; and (4) what will the future hold for documentation of California's botanical heritage?



COLLECTING GUIDELINES AND DOCUMENTATION TECHNIQUES - CNPS POLICY PAGE 3

To remedy this lack of data collection and providing substantive supporting evidence, the California Native Plant Society (CNPS) Board of Directors adopts the recommendations of the workshop. CNPS actively encourages that data collection methods be improved as recommended in order to protect California's botanical heritage. The full text of the workshop proceedings is published by the California Botanical Society (CBS) in *Madrono* 42(2).

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