## Botany Pathways

## Provide information and direction on existing rules and guidance documents

CAL FIRE and/or CDFW could provide necessary information to direct RPFs on how to address the issues identified in botanical scoping and surveying. These agencies could, independently or together, provide access to the existing memos and guidance documents and information on how to produce an effective analysis of botanical resources and special status plant species in a project area.

## Address under Technical Rule Addendum 2 by enhancing botany section.

* Encourage pre-consultation specific to botany scoping.
* Add botany-specific resources to “Identification of Information Sources” section.
* Add specifics about protecting special status plant species to the Biological Resources section.
* Where wildlife and fisheries resources are listed, include botanical resources as well.
* Add botany-specific information for choosing an assessment area.
* Include proportion of total population of special status plant species within plan area as a factor for considering cumulative impacts.

## Write botany-specific rules similar to existing rules for NSO

* Rules similar to 919.9: providing multiple regulatory pathways for the protection of special status plant species, in conformity with existing guidance documents from other agencies
* Rules similar to 919.10 – Director/Department review to evaluate whether significant impacts to a special status plant species would occur.
* Provide specifics under 919.4 – Protection of non-listed species. Include additional information on how to identify and assess impacts to these species.

## Monitoring to determine impacts, headed by the state forests or EMC-funded project

Special status plant species in California have no unifying biological features – growth forms range from mosses to trees – and each species has different potential responses to timber operations. Experiments that target potential impacts to a single plant species are not necessarily applicable to a wider range of potential species. Successful experiments would target a wide range of species, growth forms, habitats, timber management strategies, and parts of the state. Below are potential research topics that would address some of these issues.

* Analysis the size of special status plant populations for multiple years before timber operations, and for multiple years following timber operations using a protocol like those described in Elzinga, C. L., & Salzer, D. W. (1998). *Measuring & monitoring plant populations*. US Department of the Interior, Bureau of Land Management.
* Analysis of the response of special status plants to timber operations and site preparation using methods similar to the analysis of special status plan response to climate change as described in Anacker, B. L., Gogol-Prokurat, M., Leidholm, K., & Schoenig, S. (2013). Climate change vulnerability assessment of rare plants in California. *Madroño*
* Analysis of success and survival of specific plant growth forms under varying types of timber management as described in James, C. E., Krumland, B., & Taylor, D. W. (2012). Comparison of floristic diversity between young conifer plantations and second-growth adjacent forests in California's northern interior. *Western Journal of Applied Forestry*