

## Appendix K

### K-B. Integration and Synthesis Summaries: Plants - Continental United States (CONUS)

Integration and Synthesis Summaries for plant species in this appendix are divided into the following sections by Assessment Group:

- K-B1. Lichens (Group 1)
- K-B2. Ferns and Allies (Group 2)
- K-B3. Conifers and Cyads (Group 3)
- K-B4. Monocots, Abiotic Pollination vectors (Group 4)
- K-B5. Monocots, Outcrossers with Biotic Pollination vectors (Group 5)
- K-B6. Monocots, Biotic Pollination vectors; asexual reproduction or self-fertilization (Group 6)
- K-B7. Monocots, Biotic Pollination vectors; other reproductive mechanisms unknown (Group 7)
- K-B8. Dicots, Abiotic Pollination vectors (Group 8)
- K-B9. Dicots, Outcrossers with Biotic Pollination vectors (Group 9)
- K-B10. Dicots, Biotic Pollination vectors; asexual reproduction or self-fertilization (Group 10)
- K-B11. Dicots, Biotic Pollination vectors, other reproductive mechanisms unknown (Group 11)

#### *Overview of Analysis*

The following integration and synthesis analyses for plant species are done in a step-wise approach that begins with tables summarizing ranking values for vulnerability, risk, and usage, respectively, for each species within the Assessment Group (Assessment Groups are described in the *Analysis for Plant Species* section of this Biological Opinion (Opinion)). Information on how preliminary rankings were done for these three tables is found in Appendix J (worksheet). We then discuss any applicable conservation measures (i.e., new label changes) that will be implemented and that are relevant to the species, and link all of this information together for the species in the conclusion section. Our analysis is described across the taxa groups and Assessment Groups as follows:

- **Vulnerability Section:** First, in Table 1, we show a summary of information related to the species status, trends, distribution, population and individual numbers, and threats most relevant to malathion for all species within the Assessment Group. Additional supporting information on the status and related topics can be found in Appendix C of this Opinion for each species. The last column in the table indicates a vulnerability ranking of high, medium or low for each species.

- **Risk:** Next, in Table 2, we describe the anticipated risk to individuals and to the species across its range from malathion use as authorized by labels. The risk section serves as a summary of the types of effects we expect across the different uses of malathion as applicable to the species, such as sublethal effects, and indirect effects to pollinators and/or seed dispersers as applicable. The extent of the risk presented is based on exposure from malathion as authorized by the label (i.e., overlap of malathion use sites and species range) combined with taxa-specific toxicity information. Table 2 also presents any applicable risk modifiers for each species within the Assessment Group, such as method of reproduction, use of an obligate or specific pollinator, or other factors that would affect the likely risk previously described. It is important to note that the risk analysis is *described prior to any consideration about how the expected effects would be mitigated* through assumptions about anticipated usage or the inclusion of conservation measures. Thus, the risk portion of the analysis serves as an initial description of the kinds of effects that would be expected with exposure to malathion (i.e., it does not reflect our assumptions about what the net risk to the species or individuals of the species will be once the usage and conservation measures are factored in).
- **Usage:** For the usage section, in Table 3, we describe the anticipated usage (i.e., expected applications of malathion) that applies to each species in the Assessment Group, often according to different use types (e.g., agriculture, developed/open spaced developed, mosquito control usage is not shown in the table, but was considered for all species)). In Table 3, we also include overlap with Federal lands (where we anticipate usage will be low, as described in the Opinion).
- **Conservation Measures:** This section lists any conservation measures that are now being incorporated into the action that are applicable to the species in the Assessment Group and describes the types of label changes that will be incorporated. More detail on the measures are found in Appendices A-C and A-D. For most species, general conservation measures will apply. For some species, species-specific measures were identified to further reduce effects to the species.
- **Conclusion:** For this section, we summarize the main points of the preceding sections, describing anticipated vulnerability, risk from exposure across its range, and our assumptions about usage. We then consider, where applicable, examples of the conservation measures that are expected to reduce the effects and/or exposure of the listed species, and its pollinators and seed dispersers, as applicable.

While plant species are placed in Assessment Groups, the analysis for each species was considered independently. Where applicable, one rationale has been provided for all species in an Assessment group, or a sub-group of species with similar levels of vulnerability, risk, and/or usage.

### ***Other Notes***

- U.S. Fish and Wildlife Service listing and recovery documents (i.e. listing rules, five-year reviews and other status reviews, recovery plans, etc.) supporting this appendix are

available on the species profile pages at <https://ecos.fws.gov/ecp/>.

- The following analysis includes consideration of new general and species-specific conservation measures that were provided by EPA to be included as part of the Action. These measures will be incorporated in new or revised label language for malathion, as discussed in the Description of the Action and Appendix A of this Opinion. For example, a general conservation measure identified in some of the following summaries as “Mosquito adulticide timing restriction” refers back to a label restriction discussed in the Description of the Action that instructs mosquito adulticide applicators not to apply the chemical from two hours after sunrise until two hours before sunset. These measures and our related assumptions are summarized for the species within each Assessment Group after the tables summarizing species’ vulnerability, risk across the range based on labelled uses, and anticipated usage within the species range. Our conclusion and rationale are provided for the Assessment Group, sub-group, or individual species as appropriate.