

## **EXECUTIVE SUMMARY**

This Biological Opinion (Opinion) evaluates the effects of the Environmental Protection Agency's (EPA's) proposed national registration review of methomyl on endangered and threatened species and designated critical habitat under U.S. Fish and Wildlife Service (Service) jurisdiction, in accordance with section 7(a)(2) of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et seq.). This Opinion also serves as a conference report for proposed species and proposed critical habitats.

Current product labels authorize methomyl for use on a wide variety of terrestrial food and feed crops, terrestrial non-food crops, greenhouse food/non-food, and non-agricultural indoor and outdoor sites. There are currently three active registrants of methomyl, the primary of which is Tessenderlo Kerley Inc. (TKI), with 34 active product labels (16 under FIFRA Section 3, 18 under Special Local Needs), which include formulated products and technical grade methomyl. All the formulated methomyl products, with the exception of fly bait products, are Restricted Use Pesticides (RUPs) – meaning they can only be applied by, or under the supervision of, a certified applicator. Methomyl can be applied in a liquid, granular (corn only), scatter bait, bait station, or as a brush-on paste and generally from emergence to harvest for most crops. Aerial and ground application methods (including broadcast, soil incorporation, orchard airblast, and chemigation) are allowed. Registered labels require applications to use a buffer of 25 feet for ground and 100 feet for aerial applications around natural and artificial bodies of water. Additionally, granular products require a 25-foot (ground) buffer zone adjacent to waterbodies. Additional label restrictions for individual crops include restrictions on minimum temperature and plant height at application, as well as restrictions with respect to preharvest interval, retreatment interval, number of applications, and maximum application volume.

### **Key Findings**

Our analysis of the effects of the action considered the information on the methomyl label and supplemental information that we received from EPA and TKI. In this Biological and Conference Opinion, we addressed 1,060 species and 352 critical habitats. EPA also requested concurrence with their determinations that the proposed action may affect, but is not likely to adversely affect, 389 listed and proposed species and 261 designated and proposed critical habitats. EPA determined there would be no effect from the proposed action to 237 listed and proposed species and 259 designated and proposed critical habitats. In an associated Concurrence Appendix, we described our concurrence and agreement with EPA's not likely to adversely affect and no effect determinations. We also explained our reasonings behind including 18 species and 16 critical habitats in our Biological Opinion instead of the concurrence appendix (i.e., disagreeing with EPA's "no effect" or "not likely to adversely affect" determinations).

### **Analysis and Methods**

We followed an ecological risk assessment framework to determine effects to species and their critical habitats. We used information presented in EPA's BE (i.e., pesticide exposure estimates and toxicological response data), supplemental information provided by EPA since the transmission of the BE (i.e., changes to species or chemical information and usage data from the California Department of Pesticide Regulation) and from the registrant TKI, when applicable, to

predict the resulting effects to species and critical habitats. We assessed anticipated toxicological effects related to the action, including anticipated general pathways of exposure to listed species taxa groups and their designated critical habitats (i.e., physical and biological features, or PBFs). We then describe specific aspects of methomyl (e.g., chemical properties, applications rates, routes of exposure), its use on the landscape (i.e., different types of usage data), and how it will impact species and critical habitats based on these properties. We describe factors that influence exposure and effects and how we incorporated them into our analysis. Within the Integration and Synthesis section of the Opinion, we describe our approach to the analysis for each of the taxa groups which includes incorporating all aspects of the potential exposure to methomyl for the different taxonomic groups within the context of the status of the species and critical habitat, environmental baseline, and cumulative effects.

For species that EPA determined were 1) “likely to be adversely affected” by the action or 2) “not likely to be adversely affected,” but we did not concur, we assessed the species’ overall vulnerability and conducted a risk analysis. The risk analysis included metrics of exposure and expected magnitude of adverse effects. We used the percent overlap between the species’ ranges and the action area (i.e., methomyl use sites and areas of off-site transport through spray drift or runoff). When available, we used metrics for past methomyl and insecticide usage (i.e., EPA’s National and State Summary Use and Usage Matrix, U.S. Department of Agriculture’s Census of Agriculture, and California’s Department of Pesticide Registration’s Pesticide Use Report) to assess potential future exposure to methomyl. Finally, we compared estimated environmental concentrations that EPA generated to reference toxicity thresholds to determine the expected magnitude of adverse effects to individuals and necessary ecological resources, including critical habitat PBFs when applicable. Depending on the species, toxicological effects included mortality, growth inhibition, reproduction loss, reduction in habitat, or prey loss. We used these pieces of information to generate the anticipated risk of adverse effects for each species considered in this Opinion.

Following the release of our draft Opinion, we worked collaboratively with EPA, USDA, and TKI to discuss the draft Opinion, particularly those species and critical habitats for which we made preliminary conclusions of “is likely to jeopardize” or “is likely to destroy or adversely modify”. As a result of these discussions, we amended our analysis to include general conservation measures to reduce runoff into aquatic environments that TKI and EPA had previously committed to, but EPA had not considered in evaluating the effects of the action in its BE for our draft Opinion. For several aquatic species and critical habitats, these measures were sufficiently protective to avoid the likelihood of jeopardy for species or destruction or adverse modification for critical habitats. Additionally, these general conservation measures, which apply to all methomyl uses, are expected to broadly reduce exposure to non-target species and habitats, including all aquatic and aquatic-dependent listed species near methomyl use sites. We also analyzed newly listed species and critical habitats that were not included in the draft Opinion, and incorporated additional data that were not available in performing our preliminary analyses, such as usage data for some species and critical habitats. In some cases, consideration of new data resulted in a change of our determinations between the draft and final, which we describe in further detail for each affected species and critical habitat in our final Opinion.

In cases where general conservation measures proposed as part of the action did not avoid jeopardy or adverse modification, additional species-specific or critical habitat-specific measures

were developed and incorporated as part of the action to avoid jeopardy and destruction or adverse modification. Examples of such measures include the establishment of buffers to off-field habitat, requirement of measures to further reduce runoff, and restriction from application when certain crops are in bloom. Methomyl users will access these species- and critical habitat-specific measures through mandatory label instructions that direct them to EPA's *Bulletins Live! Two* website, where any relevant restrictions will be identified based on the geographic location in which the user plans to apply methomyl.

## **Results**

### *Animals*

In total, we considered 569 listed animals and 268 designated animal critical habitats in our Opinion that either EPA determined were likely to be adversely affected by the proposed action or that the EPA determined were "not likely to be adversely affected" and we did not concur. We expect direct adverse effects to animals if they occur on or near methomyl use sites or consume contaminated food items. Overall, we expect these effects to be greater when exposed to concentrations of methomyl on treated fields rather than from spray drift or runoff. We expect relatively high levels of mortality for aquatic and terrestrial invertebrates where exposure occurs. For other taxa groups, we expect variable levels of mortality, sublethal, and indirect effects based on their life history, food base, and other considerations. After considering the extent of exposure, magnitude of expected impacts to individuals and their resources, vulnerability analysis, status, environmental baseline, cumulative effects, and both general and species-specific conservation measures where needed, we conclude that the proposed action is not likely to jeopardize listed animals or adversely modify their critical habitats.

### *Plants*

In total, we considered 485 listed plants and 84 designated plant critical habitats in our Opinion that either EPA determined were likely to be adversely affected by the proposed action or that the EPA determined were "not likely to be adversely affected" and we did not concur. We expect effects to plants will occur for those that rely on pollinators or dispersers, primarily invertebrates. We do not expect direct effects to plants from exposure to methomyl, and we do not anticipate any appreciable reductions in the availability of mammalian or avian pollinators or seed dispersers. After considering the extent of exposure, magnitude of expected impacts to individuals and their resources, vulnerability analysis, status, environmental baseline, cumulative effects, and both general and species-specific conservation measures where needed, we conclude that the proposed action is not likely to jeopardize listed plants or adversely modify their critical habitats.

## **Conclusion**

In our Draft Opinion, we preliminarily concluded that the proposed action was likely to jeopardize 80 listed species and destroy or adversely modify 33 designated critical habitats. However, after considering general and species-specific conservation measures in the form of label changes that were incorporated in the action, we conclude that the registration of methomyl

is not likely to jeopardize the listed species or destroy or adversely modify the critical habitats in our final Opinion.