

Chlorpyrifos Draft Biological Evaluation

In April 2016, EPA published draft biological evaluations for three pesticides: chlorpyrifos, diazinon, and malathion.

In January 2017, EPA completed final biological evaluations for these pesticides, after reviewing stakeholder comments. To view the final biological evaluations and the response to comments, please visit:

- [Chlorpyrifos final biological evaluation](#)
- [Diazinon final biological evaluation](#)
- [Malathion final biological evaluation](#)
- [Response to Comments \(PDF\)](#) (20 pp, 977 K, [About PDF](#))

We are maintaining the files for the draft versions of these biological evaluations for anyone who would like to review them to understand how they changed from draft to final. The links to the draft biological evaluation chapters for chlorpyrifos are listed below:

[Instructions for Commenting on the Draft Biological Evaluations for Chlorpyrifos, Diazinon and Malathion \(PDF\)](#) (5 pp, 618 K)

[Draft Chlorpyrifos Executive Summary \(DOCX\)](#) (4 pp, 32 K)

[List of document revisions since December 2015 posting \(DOCX\)](#) (3 pp, 15 K)

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**Chapter 1: [Draft Chlorpyrifos Problem Formulation for ESA Assessment \(DOCX\)](#)
(58 pp, 1.22 MB)**

Attachments

- [ATTACHMENT 1-1: Ecological Incidents \(DOCX\)](#) (2 pp, 17 K)
- [ATTACHMENT 1-2: CDL Crosswalk \(DOCX\)](#)(6 pp, 35 K)
- [ATTACHMENT 1-3: Method for Establishing the Use Footprint \(DOCX\)](#)(10 pp, 31 K)
- [ATTACHMENT 1-4: Process for Determining Effects Thresholds \(DOCX\)](#)(5 pp, 27 K)
- [ATTACHMENT 1-5: Method for Deriving Species Sensitivity Distributions for Use in Pesticide Effects Determinations for Listed Species \(DOCX\)](#)(22 pp, 228 K)
- [ATTACHMENT 1-6: Co-Occurrence Analysis \(XLSX\)](#) REVISED March 2016(1 pg, 1.40 MB)
- [ATTACHMENT 1-7: Methodology for Estimating Exposures to Terrestrial Animals \(DOC\)](#) REVISED March 2016(18 pp, 84 K)
- [ATTACHMENT 1-8: Review of Open Literature Toxicity Studies for Pilot Chemical Biological Evaluations \(DOCX\)](#)(4 pp, 138 K)
- [ATTACHMENT 1-9: Applying a Weight-of-Evidence Approach to Support Step 2 Effects Determinations \(DOCX\)](#) REVISED March 2016(17 pp, 112 K)
- [ATTACHMENT 1-10: Aquatic Bin Assignments \(XLSX\)](#) REVISED March 2016(2 pp, 364 K)
- [ATTACHMENT 1-11: Biological Information on Listed Species of Fish and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#) REVISED March 2016(38 pp, 89 K)
- [ATTACHMENT 1-11 Supplemental Information 2: Fish Attribute Template \(XLSX\)](#)(2 pp, 20 K)
- [ATTACHMENT 1-11 Supplemental Information 3: Federally Listed Fish Attribute Database \(XLSX\)](#)(2 pp, 807 K)
- [ATTACHMENT 1-12: Biological Information on Listed Species of Aquatic Invertebrates and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#) REVISED March 2016(43 pp, 104 K)
- [ATTACHMENT 1-12 Supplemental Information 1: Federally Listed Aquatic Invertebrate Database \(XLSX\)](#) REVISED March 2016(2 pp, 884 K)
- [ATTACHMENT 1-12 Supplemental Information 2: Aquatic Invertebrate Attribute Template \(XLSX\)](#)(2 pp, 20 K)

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- [ATTACHMENT 1-13: Biological Information on Listed Species of Marine Mammals and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#)(63 pp, 109 K)
- [ATTACHMENT 1-14: Biological Information on Listed Species of Marine Reptiles and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#)(32 pp, 48 K)
- [ATTACHMENT 1-15: Biological Information on Listed Species of Corals and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#)(9 pp, 37 K)
- [ATTACHMENT 1-16: Biological Information on Listed Species of Birds and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#)(7 pp, 596 K)
- [ATTACHMENT 1-17: Biological Information on Listed Species of Mammals \(excluding marine species\) and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#)(4 pp, 360 K)
- [ATTACHMENT 1-18: Biological Information on Listed Species of Reptiles \(excluding marine species\) and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#)(3 pp, 161 K)
- [ATTACHMENT 1-19: Biological Information on Listed Species of Amphibians and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#)(3 pp, 210 K)
- [ATTACHMENT 1-20: Biological Information on Listed Species of Terrestrial Invertebrates and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#) REVISED March 2016(46 pp, 149 K)
- [ATTACHMENT 1-20 Supplemental Information 3: Federally Terrestrial Invertebrate Database \(XLSX\)](#) REVISED(1 pg, 367 K)
- [ATTACHMENT 1-21: Biological Information on Listed Species of Plants and Lichens and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#) REVISED March 2016(7 pp, 33 K)
- [ATTACHMENT 1-21 Supplemental Information 1: Federally Listed Plant Attribute Database \(XLSX\)](#) REVISED March 2016(4 pp, 12.56 MB)
- [ATTACHMENT 1-21 Supplemental Information 2: Summary Plant and Lichen Information \(XLSX\)](#) REVISED March 2016(7 pg, 236 K)
- [ATTACHMENT 1-22: Effects Arrays \(DOCX\)](#)(1 pg, 18 K)

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- [APPENDIX 1-3: Master Use Summary Table for Chlorpyrifos \(DOCX\)](#)(47 pp, 134 K)
- [APPENDIX 1-4: Tank Mixes Specified on Chlorpyrifos Product Labels \(DOCX\)](#)(74 pp, 73 K)
- [APPENDIX 1-5: Commitment Letters from Chlorpyrifos Registrants \(PDF\)](#)(123 pp, 2.38 MB, [About PDF](#))
- [APPENDIX 1-6: Use Site, General Land Cover Class, and HUC2 Matrix for Chlorpyrifos \(DOCX\) REVISED March 2016](#)(17 pp, 34 K)
- [APPENDIX 1-7: Chlorpyrifos Scenario Development \(DOCX\)](#)(40 pp, 114 K)
- [APPENDIX 1-8: Usage Data for Chlorpyrifos \(DOCX\)](#)(12 pp, 2.02 MB)
- [APPENDIX 1-9: Degradate Line of Evidence \(DOCX\)](#)(9 pp, 36 K)
- [APPENDIX 1-10: Summary of Chlorpyrifos Monitoring Data \(DOCX\)](#)(18 pp, 73 K)
- [APPENDIX 1-11: Multi-A.I. Formulation Analysis for Chlorpyrifos \(DOCX\)](#)(4 pp, 26 K)
- [APPENDIX 1-12: ECOTOX Mixture Studies \(Chlorpyrifos\) \(DOCX\)](#)(7 pp, 26 K)

[Chapter 2: Draft Chlorpyrifos Effects Characterization for ESA Assessment \(DOCX\)](#)(241 pp, 6.37 MB)

Attachments

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- [ATTACHMENT 1-4: Process for Determining Effects Thresholds \(DOCX\)](#)(5 pp, 27 K)
- [ATTACHMENT 1-5: Method for Deriving Species Sensitivity Distributions for Use in Pesticide Effects Determinations for Listed Species \(DOCX\)](#)(22 pp, 228 K)
- [ATTACHMENT 1-8: Review of Open Literature Toxicity Studies for Pilot Chemical Biological Evaluations \(DOCX\)](#)(47 pp, 138 K)
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- [APPENDIX 2-2: Accepted ECOTOX Database \(XLSX\)](#)(2 pp, 4.46 MB)

- [APPENDIX 2-3 Open Literature Review for Chlorpyrifos \(DOCX\)](#)(111 pp, 393 K)
- [APPENDIX 2-4: OPPIN Bibliography for Chlorpyrifos \(DOCX\)](#)(433 pp, 328 K)
- [APPENDIX 2-5: Rejected ECOTOX Bibliography \(DOCX\)](#)(1722 pp, 2.09 MB)
- [APPENDIX 2-6: Chlorpyrifos Species Sensitivity Distribution Analysis for Fish \(DOCX\)](#)(22 pp, 193 K)
- [APPENDIX 2-7: Additional Effects Arrays for Chlorpyrifos \(DOCX\)](#)(10 pp, 2.17 MB)
- [APPENDIX 2-8: Chlorpyrifos Species Sensitivity Distribution Analysis for Aquatic Invertebrates \(DOCX\)](#)(23 pp, 2.64 MB)
- [APPENDIX 2-9: Chlorpyrifos Species Sensitivity Distribution Analysis for Birds \(DOCX\)](#)(3 pp, 37 K)

Chapter 3: Draft Chlorpyrifos Exposure Characterization for ESA Assessment (DOCX) REVISED March 2016(55 pp, 1.40 MB)

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[ATTACHMENT 3-1: Background Document: Aquatic Exposure Estimation for Endangered Species \(DOCX\) REVISED March 2016\(51 pp, 405 K\)](#)

- [ATTACHMENT 3-1 Supplemental Information 1: Static Bin Analysis \(XLSX\)](#)(1 pg, 85 K)

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- [APPENDIX 1-3: Master Use Summary Table for Chlorpyrifos \(DOCX\)](#)(47 pp, 134 K)
- [APPENDIX 1-6: Use Site, General Land Cover Class, and HUC2 Matrix for Chlorpyrifos \(DOCX\) REVISED March 2016\(19 pp, 35 K\)](#)
- [APPENDIX 1-7: Chlorpyrifos Scenario Development \(DOCX\)](#)(40 pp, 114 K)
- [APPENDIX 3-1: Environmental Transport and Fate Data Analysis for Chlorpyrifos \(DOCX\)](#)(24 pp, 405 K)
- [APPENDIX 3-2: Chlorpyrifos Fate Open Literature Review \(XLSX\)](#)(2 pp, 1276 K)
- [APPENDIX 3-3: Spray Drift Considerations for Chlorpyrifos \(DOCX\) REVISED March 2016\(10 pp, 128 K\)](#)
- [APPENDIX 3-4: Aquatic EECs \(XLSX\) REVISED March 2016\(1 pp, 3.70 MB\)](#)
- [APPENDIX 3-4f: PWC Postprocessor Output \(ZIP\) \(Please save this file prior to opening\)](#)(1 file, 3.45 GB)
- [APPENDIX 3-5: Chlorpyrifos Downstream Dilution \(DOCX\)](#) (1 pg, 15 K)
- [APPENDIX 3-6: Input Parameters for Weight of Evidence Matrices \(XLSX\)](#)(1 pg, 96K)

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Chapter 4: Draft Chlorpyrifos Effects Determinations for ESA Assessment (DOCX)(43 pp, 145 K)

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- [ATTACHMENT 4-2: Regression Analysis of Exposure Response Data from Chronic Aquatic Toxicity Tests for Chlorpyrifos, Diazinon and Malathion \(DOCX\)\(12 pp, 266 K\)](#)
- [ATTACHMENT 4-2 Supplemental Information 1: Appendix A- Response Curve Modeling \(DOCX\)\(11 pp, 263 K\)](#)
- [ATTACHMENT 4-2 Supplemental Information 2: Appendix B- Guidelines for Assessing Relative Quality of TRAP Analysis Graphs \(DOCX\)\(8 pp, 267 K\)](#)
- [ATTACHMENT 4-2 Supplemental Information 3: Appendix C- Index and Tabular Results \(XLSX\)\(1 pg, 28 K\)](#)
- [ATTACHMENT 4-2 Supplemental Information 4: Appendix D- TRAP Analysis Graphs and ECx Values \(PDF\)\(59 pp, 838K\)](#)
- [ATTACHMENT 4-3: Application of Web-ICE to Assess Risks of National Pesticide Registrations to Federally Listed Species \(DOCX\)\(9 pp, 44 K\)](#)
- [ATTACHMENT 4-3 Supplemental Information 1: Acute Toxicity Prediction to Threatened and Endangered Species Using Interspecies Correlation Estimation \(ICE\) Models \(DOCX\)\(26 pp, 102 K\)](#)
- [ATTACHMENT 4-3 Supplemental Information 1.1 \(DOCX\)\(5 pp, 467K\)](#)
- [ATTACHMENT 4-3 Supplemental Information 1.2 \(XLSX\)\(1 pg, 155 K\)](#)
- [ATTACHMENT 4-3 Supplemental Information 2: Analysis of Predicted vs. Empirical SSDs for Malathion \(DOCX\)\(21 pp, 87K\)](#)
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- [APPENDIX 4-6: Analysis of Seed Treatment and Granular Uses \(DOCX\)](#)(10 pp, 35 K)
- [APPENDIX 4-7: Refined Risk Analyses for 14 Listed Birds Exposed to Chlorpyrifos \(DOCX\)](#)(18 pp, 347 K)
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