

Diazinon 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 diazinon are listed below:

[List of document revisions since December 2015 \(DOCX\)](#) (3 pp, 20 K)

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

[Draft Diazinon Executive Summary \(DOCX\)](#) (4 pp, 30 K)

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Chapter 1: Draft Diazinon Problem Formulation for ESA Assessment (DOCX)(63 pp, 858 K)

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 \(DOX\)](#) (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 pp, 1.40 KB)
- [ATTACHMENT 1-7: Methodology for Estimating Exposures to Terrestrial Animals \(DOCX\)](#) REVISED March 2016(18 pp, 85 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(1 pp, 364 K)
- [ATTACHMENT 1-11: Biological Information on Listed Species of Fish and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#) REVISED March 2016(44 pp, 93 K)
 - [ATTACHMENT 1-11 Supplemental Information 2: Fish Attribute Template \(XLSX\)](#)(1 pp, 20 K)
 - [ATTACHMENT 1-11 Supplemental Information 3: Federally Listed Fish Attribute Database \(XLSX\)](#) REVISED March 2106(1 pp, 822 K)
- [ATTACHMENT 1-12: Biological Information on Listed Species of Aquatic Invertebrates and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#) REVISED March 2016(47 pp, 113 K)
- [ATTACHMENT 1-12 Supplemental Information 1: Federally Listed Aquatic Invertebrate Database \(XLSX\)](#) REVISED March 2016(1 pp, 890 K)
 - [ATTACHMENT 1-12 Supplemental Information 2: Aquatic Invertebrate Attribute Template \(XLSX\)](#) (1 pp, 20 K)

- [ATTACHMENT 1-13: Biological Information on Listed Species of Marine Mammals and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#) (63 pp, 108K)
- [ATTACHMENT 1-14: Biological Information on Listed Species of Marine Reptiles and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#) (29 pp, 47 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 \(DOCX\)](#) (318 pp, 596 K)
- [ATTACHMENT 1-17: Biological Information on Listed Species of Mammals \(excluding marine species\) and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#) (244 pp, 360 K)
- [ATTACHMENT 1-18: Biological Information on Listed Species of Reptiles \(excluding marine species\) and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#) (103 pp, 161 K)
- [ATTACHMENT 1-19: Biological Information on Listed Species of Amphibians and Model Parameterization for Pesticide Effects Determinations \(DOCX\)](#) (123 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](#)(47 pp, 152 K)
 - [ATTACHMENT 1-20 Supplemental Information 3: Federally Listed Terrestrial Invertebrate Database \(XLSX\)](#) (1 pp, 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](#) (8 pp, 33 K)
 - [ATTACHMENT 1-21 Supplemental Information 1: Federally Listed Plant Attribute Database \(XLSX\) REVISED 2016](#) (1 pp, 12.5 MB)
 - [ATTACHMENT 1-21 Supplemental Information 2: Summary Plant and Lichen Information \(XLSX\) REVISED March 2016](#) (1 pg, 252 K)
- [ATTACHMENT 1-22: Effects Arrays \(DOCX\)](#) (1 pp, 18 K)

Appendices

- [APPENDIX 1-1: Regulatory History 4-and Past Assessments for Diazinon \(DOCX\)](#) (1 pp, 34 K)
- [APPENDIX 1-2: List of Current Diazinon Registrations \(Registration Numbers and Label Stamp Dates\) \(DOCX\)](#) (1 pp, 30 K)
- [APPENDIX 1-3: Abbreviated Use Summary Table for Diazinon \(DOCX\)](#) (5 pp, 58 K)
- [APPENDIX 1-4: Tank Mixes Specified on Diazinon Product Labels \(DOCX\)](#) (6 pp, 42 K)
- [APPENDIX 1-5: Label Clarifications from Diazinon Registrants \(PDF\)](#) (2 pp, 82 K, [About PDF](#))
- [APPENDIX 1-6: Use Site, General Land Cover Class, and HUC2 Matrix for Diazinon \(DOCX\)REVISED March 2016](#) (5 pp, 25 K)
- [APPENDIX 1-6 a: General Land Cover Class and Use Site for Diazinon \(XLSX\)](#) (1 pp, 27 K)
- [APPENDIX 1-7: Diazinon Scenario Development \(DOCX\)](#) (6 pp, 38 K)
- [APPENDIX 1-8: Usage Data for Diazinon \(DOCX\)](#) (6 pp, 37 K)
- [APPENDIX 1-9: Degradate Line of Evidence \(DOX\)](#) (10 pp, 48 K)
- [APPENDIX 1-10: Summary of Diazinon Monitoring Data \(DOCX\)](#) (27 pp, 221 K)
- [APPENDIX 1-11: Multi-A.I. Formulation Analysis for Diazinon \(DOCX\)](#) (1 pp, 11 K)
- [APPENDIX 1-12: ECOTOX Mixture Studies \(Diazinon\) \(DOCX\)](#) (2 pp, 17 K)

Chapter 2: Draft Diazinon Effects Characterization for ESA Assessment (DOCX)(152 pp, 2.02 MB)

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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)
- [ATTACHMENT 1-22: Effects Arrays \(DOCX\)](#) (1 pg, 18 K)

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- [APPENDIX 2-1: Data Used in the Data Array \(XLSX\)](#) (1 pp, 825 K)
- [APPENDIX 2-2: Accepted ECOTOX Database \(XLSX\)](#) (2 pp, 1.39 MB)
- [APPENDIX 2-3 Open Literature Review for Diazinon \(DOCX\)](#) (52 pp, 957 K)
- [APPENDIX 2-4: OPPIN Bibliography for Diazinon \(PDF\)](#) (222 pp, 440 K, [About PDF](#))
- [APPENDIX 2-5: Diazinon Rejected ECOTOX Bibliography \(DOCX\)](#) (114 pp, 1.30 MB)
- [APPENDIX 2-6: Diazinon Species Sensitivity Distribution Analysis for Fish \(DOCX\)](#) (5 pp, 40 K)
- [APPENDIX 2-7: Additional Effects Arrays for Diazinon \(DOCX\)](#) (2 pp, 14 K)
- [APPENDIX 2-8: Diazinon Species Sensitivity Distribution Analysis for Aquatic Invertebrates \(DOCX\)](#) (13 pp, 56 K)
- [APPENDIX 2-9: Diazinon Species Sensitivity Distribution Analysis for Birds \(DOCX\)](#) (5 pp, 26 K)

Chapter 3: Draft Diazinon Exposure Characterization for ESA Assessment (DOCX) REVISED March 2016(67 pp, 1.74 MB)

Attachments

- [ATTACHMENT 3-1: Background Document: Aquatic Exposure Estimation for Endangered Species \(DOCX\) REVISED March 2016](#) (52 pp, 1.47 MB)
- [ATTACHMENT 3-1 Supplemental Information 1: Static Bin Analysis \(XLSX\)](#) (1 pg, 85 K)

Appendices

- [APPENDIX 1-3: Master Use Summary Table for Diazinon \(DOCX\)](#) (5 pp, 58 K)
- [APPENDIX 1-6: Use Site, General Land Cover Class, and HUC2 Matrix for Diazinon \(DOCX\) REVISED March 2016](#) (6 pp, 26 K)
- [APPENDIX 1-7: Diazinon Scenario Development \(DOCX\)](#) Revised March 2016 (6 pp, 38 K)
- [APPENDIX 1-9: Degradate Line of Evidence \(DOCX\)](#) (10 pp, 48 K)
- [APPENDIX 3-1: Environmental Transport and Fate Data Analysis for Diazinon \(DOCX\) REVISED March 2016](#) (25 pp, 165 K)
- [APPENDIX 3-2: Diazinon Fate Open Literature Review \(XLSX\)](#) (1 pp, 5.46 MB)
- [APPENDIX 3-3: Spray Drift Considerations for Diazinon \(DOCX\)](#) (2 pp, 205 K)
- [APPENDIX 3-4 a: Diazinon Aquatic Modeling Inputs \(XLSX\) REVISED March 2016](#) (1 pp, 9.95 MB)
- [APPENDIX 3-4 b: Aquatic EECs Step 2 \(XLSX\) REVISED March 2016](#) (1 pp, 145 K)
- [APPENDIX 3-4 c: Aquatic EECs PFAM \(XLSX\)](#) (1 pp, 43.38 MB)
- [APPENDIX 3-4 d: Aquatic EECs Sensitivity Analysis \(XLSX\)](#) (1 pp, 4.02 MB)
- [APPENDIX 3-4 e: Example Aquatic Modeling Figure with Effects Endpoints \(DOCX\)](#) (2 pp, 147 K)
- [APPENDIX 3-4 f: PWC Postprocessor Output \(ZIP\)](#) (1 pp, 1.40 GB)
- [APPENDIX 3-5: Diazinon Downstream Dilution \(DOCX\)](#) (58 pp, 337 K)
- [APPENDIX 3-6: Input Parameters for Weight of Evidence Matrices \(XLSX\)](#) 1 pp, 96K)

Chapter 4: Draft Diazinon Effects Determinations for ESA Assessment (42 pp, 128 K)

Attachments

- [ATTACHMENT 4-1: Terrestrial and Aquatic Weight of Evidence Matrices: Tool Methodology and Description \(DOCX\)](#) (31 pp, 2.08 MB)
- [ATTACHMENT 4-2: Regression Analysis of Exposure Response Data from Chronic Aquatic Toxicity Tests for Chlorpyrifos, Diazinon and Malathion \(DOCX\)](#) (11 pp, 266 K)
- [ATTACHMENT 4-2 Supplemental Information 1: Appendix A- Response Curve Modeling \(DOCX\)](#) (11 pp, 262 K)
 - [ATTACHMENT 4-2 Supplemental Information 2: Appendix B- Guidelines for Assessing Relative Quality of TRAP Analysis Graphs \(DOCX\)](#) (8 pp, 278 K)
 - [ATTACHMENT 4-2 Supplemental Information 3: Appendix C- Index and Tabular Results \(XLSX\)](#) (1 pp, 28 K)
 - [ATTACHMENT 4-2 Supplemental Information 4: Appendix D- TRAP Analysis Graphs and ECx Values \(PDF\)](#) (59 pp, 838 K)(59 pp, 383K, [About PDF](#))
 - [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 \(DOCX\)](#) (26 102, yy K)
 - [ATTACHMENT 4-3 Supplemental Information 1.1 \(DOCX\)](#) (5 pp, 457 K)
 - [ATTACHMENT 4-3 Supplemental Information 1.2 \(XLSX\)](#) (1 pp, 155 K)
 - [ATTACHMENT 4-3 Supplemental Information 2: Analysis of Predicted vs. Empirical SSDs for Malathion \(DOCX\)](#) (21 pp, 87 K)
 - [ATTACHMENT 4-3 Supplemental Information 3: Analysis of Predicted vs. Empirical SSDs for Chlorpyrifos \(DOCX\)](#) (19 pp, 81 K)
 - [ATTACHMENT 4-3 Supplemental Information 4: Analysis of Predicted vs. Empirical SSDs for Diazinon \(DOCX\)](#) (19 pp, 84 K)

Appendices

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- [APPENDIX 4-2: Mixtures Analysis for Diazinon \(DOCX\)](#) (12 pp, 155 K)
- APPENDIX 4-3: Weight of Evidence Matrices
 - [APPENDIX 3-6: Input Parameters for Weight of Evidence Matrices \(XLSX\)](#) (1 pp, 96 K)
 - [APPENDIX 4-3a: Amphibians All DIA \(XLS\)](#) (1 pp, 540 K)
 - [APPENDIX 4-3b: Reptiles DIA \(XLSX\)](#) (1 pp, 363 K)
 - [APPENDIX 4-3c: Birds Passerine DIA \(XLSX\)](#) (1 pp, 291K)
 - [APPENDIX 4-3d: Birds All other orders DIA \(XLSX\)](#) (1 pp, 588 K)
 - [APPENDIX 4-3e: Mammals All DIA \(XLSX\)](#) (1 pp, 638 K)
 - [APPENDIX 4-3f: Terrestrial Invertebrates Arachnids and Insects DIA \(XLSX\)](#) (1 pp, 565 K)
 - [APPENDIX 4-3g: Terrestrial Invertebrates Snails DIA \(XLSX\)](#) (1 pp, 338 K)
 - [APPENDIX 4-3h: Fish Cypriniformes DIA \(XLSX\)](#) (1 pp, 453 K)
 - [APPENDIX 4-3i: Fish Salmoniformes DIA \(XLSX\)](#) (1 pp, 329 K)
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 - [APPENDIX 4-3k: Aquatic Invertebrates Insects and Crustaceans DIA \(XLSX\)](#) (1 pp, 273 K)
 - [APPENDIX 4-3l: Aquatic Invertebrates Mollusks Unionida1 DIA \(XLSX\)](#) (1 pp, 476 K)
 - [APPENDIX 4-3m: Aquatic Invertebrates Mollusks Unionida2 DIA \(XLSX\)](#) (1 pp, 528 K)
 - [APPENDIX 4-3n: Aquatic Invertebrates All other orders DIA \(XLSX\)](#) (1 pp, 305 K)
 - [APPENDIX 4-3o: MARINE species Coral DIA \(XLSX\)](#) (1 pp, 183 K)
 - [APPENDIX 4-3p: MARINE species Fish and Other Invertebrates DIA \(XLSX\)](#) (1 pp, 136 K)
 - [APPENDIX 4-3q: Plants General DIA \(XLSX\)](#) (1 pp, 695 K)
 - [APPENDIX 4-3r: Plants Herbaceous Dicot 1 DIA \(XLSX\)](#) (1 pp, 573 K)
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- [APPENDIX 4-3v: Plants Herbaceous Dicot 5 DIA \(XLSX\)](#) (1 pp, 488 K)
- [APPENDIX 4-3w: Plants Herbaceous Monocot DIA \(XLSX\)](#) (1 pp, 748 K)
- [APPENDIX 4-3x: Plants Woody Dicot 1 DIA \(XLSX\)](#) (1 pp, 556 K)
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- [APPENDIX 4-3aa: Plants Woody Dicot 4 DIA \(XLSX\)](#) (1 pp, 565 K)
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- [APPENDIX 4-4: Risk Assessment for Cattle Ear Tag Use \(DOCX\)](#) (102 pp, 319K)
- [APPENDIX 4-5: Analysis of Mosquito Adulticide Use \(DOCX\)](#) (1 pp, 12 K)
- [APPENDIX 4-6: Analysis of Seed Treatment and Granular Uses \(DOCX\)](#) (1 pp, 12 K)
- [APPENDIX 4-7: Refined Risk Analyses for 11 Listed Birds Exposed to Diazinon \(DOCX\)](#) (23 pp, 127 K)
- [APPENDIX 4-7 Supplemental Information 1: TIM/MCnest Metadata \(DOCX\)](#) (48 pp, 118 K)
- [APPENDIX 4-7 Supplemental Information 2: GAP Land covers assigned as preferred habitats \(XLSX\)](#) (1 pp, 28 K)