**APPENDIX 2-5. Carbaryl Species Sensitivity Distribution Analysis for Fish**

SSDs were fit to toxicity data for freshwater and saltwater fish and amphibians exposed to carbaryl. Five distributions were tested and a variety of methods were used to determine whether different subsets of data should be modeled independently. These results support separating the data into SSDs for modeling fish only and amphibians only.  **Table 1** provides a summary of the results.

Table . Summary statistics for SSDs fit to carbaryl test results.

|  |  |  |
| --- | --- | --- |
| Statistic | Fish Only | Amphibians Only |
| Best Distribution (by AICc) | triangular | logistic |
| Goodness of fit  P-value | 0.4795 | 0.7263 |
| CV of the HC05 | 0.1498 | 0.348 |
| HC05 | 1.0554 | 2.3318 |
| HC10 | 1.3543 | 3.2107 |
| HC50 | 3.8789 | 8.2235 |
| HC90 | 11.1100 | 21.0627 |
| HC95 | 14.2562 | 29.0014 |

1Default Slope = 4.5.

# Data

Data used in this analysis were from literature that passed the ECOTOX quality screen (catalogued in **APPENDIX 2-2** plus data from submitted studies, and are detailed in **Tables 11, 12** and **13** (end of document). **Table 2** provides the distribution of the test results for carbaryl including the number of species represented.

**Table 2. Distribution of test results available for carbaryl.**

|  |  |  |
| --- | --- | --- |
| Data Subset | Test results | Species |
| All Aquatic Vertebrates | 263 | 62 |
| All Fish | 238 | 48 |
| Aquatic Amphibians | 25 | 14 |

**Figure 1** shows the distribution of test results among species, indicating that a few species have been repeatedly tested (eight species have been tested at least 8 times each), but the majority of species have been tested fewer than six times, with 20 species having only one test result.

**Figure 1. Distribution of the number of test results per species in Carbaryl aquatic vertebrate data.**

Five potential distributions for the carbaryl data were considered, including log-normal, log-logistic, log-triangular, log-gumbel, and Burr. To fit each of the first four distributions, the toxicity values were first common log (log10) transformed. Finally, direct and indirect effect thresholds and five quantiles from the fitted SSDs (HC05, HC10, HC50, HC90, HC95) were calculated and reported.

# Comparison of distributions using AICc

Akaike’s Information Criterion corrected for sample size (AICc) was used to compare the five distributions for all four datasets. For these comparisons all SSDs were fit using maximum likelihood. For the dataset that included only amphibians, AICc suggested that the logistic distribution provided the best fit (**Table 3**). For all fish, AICc suggested that the triangular distribution provided the best fit (**Table 4**). For all fish and amphibians pooled together, AICc suggested that the triangular distribution provided the best fit (**Table 5**)**.**

**Table 3. Comparison of distributions for all amphibian toxicity data for carbaryl.**

| distribution | AICc | ∆AICc | Weight | HC05 |
| --- | --- | --- | --- | --- |
| gumbel | 104 | 5.43 | 0.022 | 2.02 |
| burr | 99.5 | 0.618 | 0.241 | 1.69 |
| logistic | 99.9 | 1.05 | 0.194 | 2.33 |
| normal | 99.7 | 0.841 | 0.216 | 2.14 |
| triangular | 98.9 | 0 | 0.328 | 2.11 |

**Table 4. Comparison of distributions for all fish toxicity data for carbaryl.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| distribution | AICc | ∆AICc | Weight | HC05 |
| gumbel | 251 | 4.52 | 0.055 | 1.19 |
| burr | 251 | 4.43 | 0.057 | 1.16 |
| logistic | 249 | 3.19 | 0.106 | 0.996 |
| normal | 248 | 1.38 | 0.262 | 1.07 |
| triangular | 246 | 0 | 0.521 | 1.06 |

**Table 5. Comparison of distributions for pooled fish and amphibian toxicity data for carbaryl.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| distribution | AICc | ∆AICc | Weight | HC05 |
| triangular | 348 | 0 | 0.768 | 1.12 |
| normal | 351 | 2.82 | 0.188 | 1.15 |
| logistic | 355 | 7.02 | 0.023 | 1.05 |
| gumbel | 357 | 8.34 | 0.012 | 1.27 |
| burr | 356 | 8.34 | 0.012 | 1.22 |

# Test for the need to model results separately by medium or vertebrate class

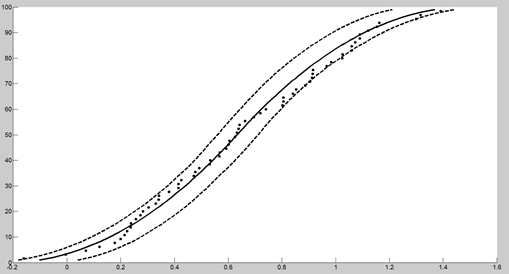
Determination of appropriate subsets of data for SSD fitting is difficult and the recommendation here is to use multiple parameters to make the determination. In particular, the question of whether to model amphibian toxicity data separately from fish data is examined (Note: in the end amphibians and all fish were included in separate SSD’s).

First, examination of the cumulative distribution functions plotted on similar axes for all fish versus all amphibians does not lend support to modeling the datasets together; a visual inspection indicates they are structurally different. Furthermore, the 95% bootstrap confidence intervals for the separate distributions do not overlap (1.55 to 4.08 for amphibians compared with 0.8767 to 1.4896 for fish) (**Figure 2**). The confidence limits on the HC05 for both separate distributions are relatively precise, with the upper confidence limit falling at the 12th and 19th percentile for fish and amphibians, respectively **(Tables 9** and **10**). Also, in both cases the CV of the HC05 is below 1.

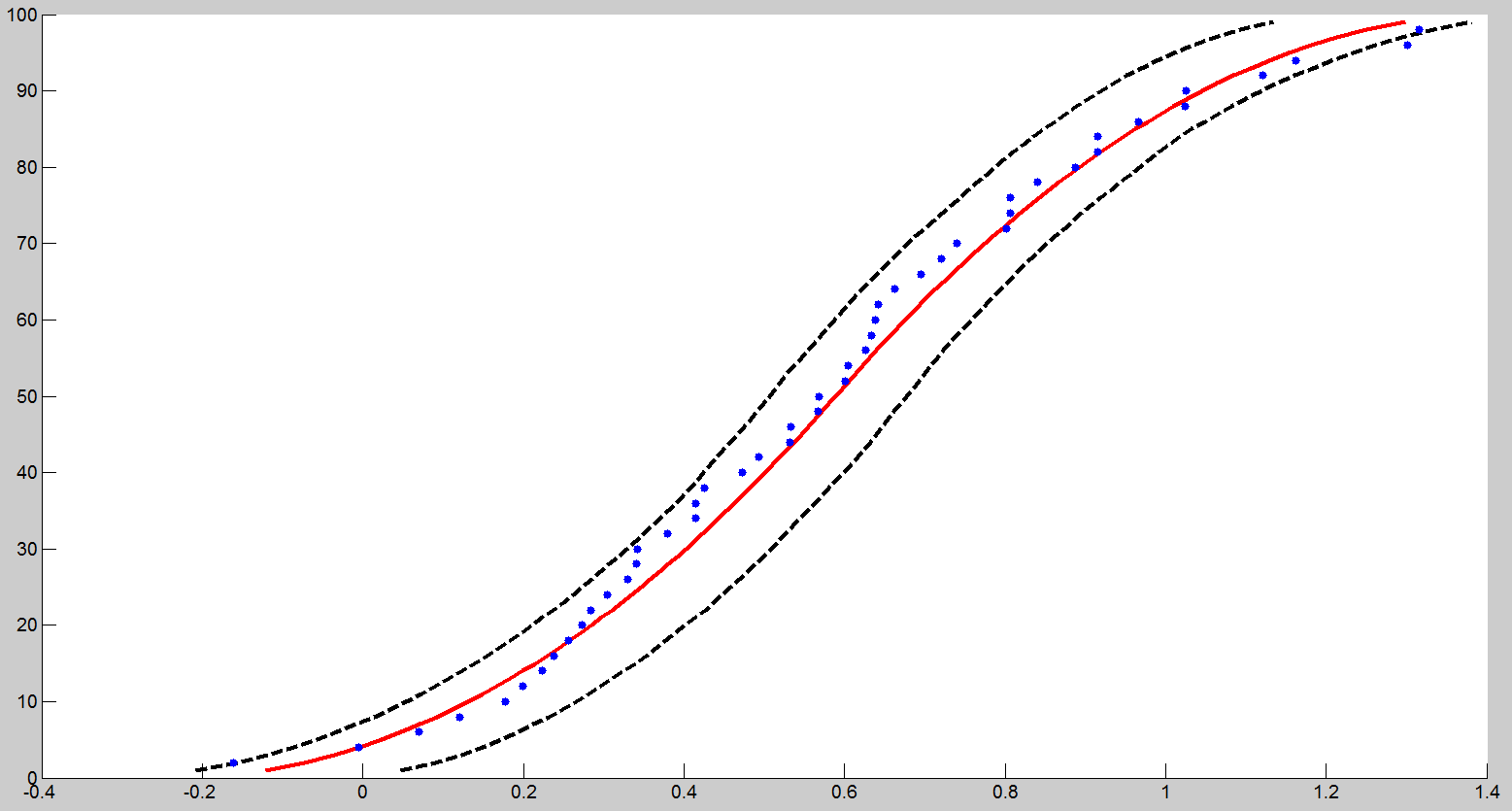
These analyses favor separating amphibians from fish rather than using an SSD approach of combined freshwater vertebrates to assess amphibians.

# Goodness-of-fit

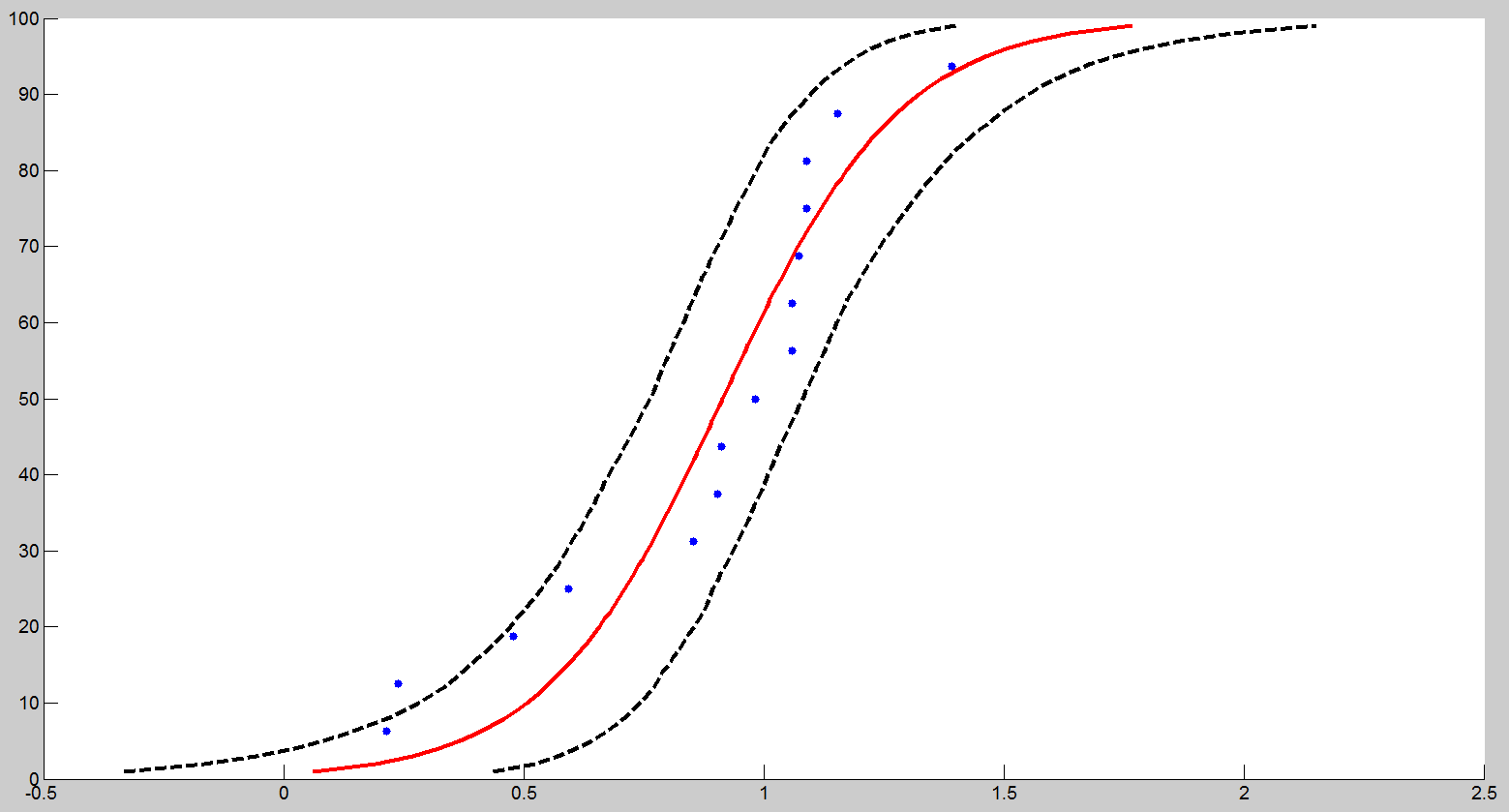
Plots of the cumulative distribution functions for the best-fit distributions (as determined by AICc) suggest little evidence of lack-of-fit with the exception of separating fish data from amphibian data (**Figs. 2, 3, and 4**). Similarly, bootstrap goodness-of-fit tests did not show evidence for lack-of-fit (P-values > 0.05, **Tables 6, 7, and 8**). The coefficient of variation for the HC05 was below 1 for all distributions.



**Figure 2. Log-triangular SSD for carbaryl toxicity values for all aquatic vertebrates pooled.**



**Figure 3. Log-triangular SSD for carbaryl LC50s for all fish.**



**Figure 4. Log-logistic SSD for carbaryl LC50s for all amphibians.**

**Table 6. Range of HC05 values for carbaryl SSDs for all aquatic vertebrates.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Distribution | Method | HC05 | SE | CV | LCx | UCx | LCp | UCp | P |
| normal | ML | 1.1509 | 0.2049 | 0.1780 | 0.8616 | 1.5967 | 0.0228 | 0.1065 | 0.3596 |
| normal | MO | 1.1388 | 0.1809 | 0.1589 | 0.8304 | 1.5440 | 0.0213 | 0.1010 | 0.3377 |
| normal | GR | 1.0631 | 0.1768 | 0.1663 | 0.7175 | 1.3923 | 0.0179 | 0.0911 | 0.2258 |
| logistic | ML | 1.0474 | 0.2012 | 0.1921 | 0.7410 | 1.5130 | 0.0252 | 0.1006 | 0.2478 |
| logistic | MO | 1.1591 | 0.2149 | 0.1854 | 0.7847 | 1.6307 | 0.0218 | 0.1002 | 0.3227 |
| logistic | GR | 1.0388 | 0.1917 | 0.1845 | 0.6302 | 1.3747 | 0.0187 | 0.0851 | 0.1838 |
| triangular | ML | 1.1150 | 0.1406 | 0.1261 | 0.9457 | 1.4988 | 0.0271 | 0.1086 | 0.4016 |
| triangular | MO | 1.1109 | 0.1617 | 0.1455 | 0.8532 | 1.4832 | 0.0172 | 0.1054 | 0.3347 |
| triangular | GR | 1.0716 | 0.1677 | 0.1565 | 0.7649 | 1.4150 | 0.0118 | 0.1014 | 0.2468 |
| gumbel | ML | 1.2705 | 0.2236 | 0.1760 | 0.9548 | 1.6060 | 0.0129 | 0.1100 | 0.6424 |
| gumbel | MO | 1.5069 | 0.1855 | 0.1231 | 1.1804 | 1.9124 | 0.0126 | 0.1263 | 0.9740 |
| gumbel | GR | 1.4071 | 0.1754 | 0.1247 | 0.9913 | 1.6813 | 0.0070 | 0.0985 | 0.8092 |
| burr | ML | 1.2146 | 0.2044 | 0.1683 | 0.8721 | 1.7041 | 0.0194 | 0.1163 | 0.0949 |

ML=maximum likelihood, MO= moment estimators, and GR=graphical methods

LCp and UCp=projections of the confidence limits of the HC05 (LCx and UCx) onto the cumulative distribution function of the fitted distribution.

**Table 7. Range of HC05 values for carbaryl SSDs for all fish.**

| Distribution | Method | HC05 | SE | CV | LCx | UCx | LCp | UCp | P |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| normal | ML | 1.0668 | 0.2066 | 0.1936 | 0.7529 | 1.5149 | 0.0179 | 0.1174 | 0.4096 |
| normal | MO | 1.0530 | 0.1792 | 0.1702 | 0.7555 | 1.4541 | 0.0191 | 0.1096 | 0.3766 |
| normal | GR | 0.9727 | 0.1775 | 0.1824 | 0.6247 | 1.3205 | 0.0145 | 0.1013 | 0.2478 |
| logistic | ML | 0.9962 | 0.1951 | 0.1959 | 0.6750 | 1.4611 | 0.0215 | 0.1106 | 0.2797 |
| logistic | MO | 1.0707 | 0.2078 | 0.1941 | 0.7407 | 1.5351 | 0.0218 | 0.1089 | 0.4126 |
| logistic | GR | 0.9456 | 0.1976 | 0.2090 | 0.5140 | 1.2683 | 0.0142 | 0.0895 | 0.2268 |
| triangular | ML | 1.0554 | 0.1581 | 0.1498 | 0.8767 | 1.4896 | 0.0239 | 0.1236 | 0.4795 |
| triangular | MO | 1.0287 | 0.1665 | 0.1618 | 0.7636 | 1.4180 | 0.0127 | 0.1177 | 0.4056 |
| triangular | GR | 0.9852 | 0.1551 | 0.1575 | 0.6973 | 1.2984 | 0.0098 | 0.1043 | 0.2777 |
| gumbel | ML | 1.1892 | 0.1998 | 0.1680 | 0.9151 | 1.5253 | 0.0131 | 0.1213 | 0.6753 |
| gumbel | MO | 1.3701 | 0.1732 | 0.1264 | 1.0804 | 1.7576 | 0.0118 | 0.1374 | 0.9550 |
| gumbel | GR | 1.2683 | 0.1695 | 0.1336 | 0.8826 | 1.5398 | 0.0056 | 0.1070 | 0.7073 |
| burr | ML | 1.1573 | 0.2131 | 0.1842 | 0.7946 | 1.6517 | 0.0149 | 0.1316 | 0.7952 |

ML=maximum likelihood, MO= moment estimators, and GR=graphical methods

LCp and UCp=projections of the confidence limits of the HC05 (LCx and UCx) onto the cumulative distribution function of the fitted distribution.

**Table 8. Range of HC05 values for carbaryl SSDs for all amphibians.**

| Distribution | Method | HC05 | SE | CV | LCx | UCx | LCp | UCp | P |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| normal | ML | 2.1357 | 0.7511 | 0.3517 | 1.2239 | 4.1332 | 0.0087 | 0.2185 | 0.7423 |
| normal | MO | 2.0439 | 0.7110 | 0.3479 | 1.0794 | 3.7439 | 0.0070 | 0.1904 | 0.6823 |
| normal | GR | 1.6808 | 0.5747 | 0.3419 | 0.6337 | 2.7950 | 0.0033 | 0.1392 | 0.4895 |
| logistic | ML | 2.3318 | 0.8115 | 0.3480 | 1.2131 | 4.3857 | 0.0113 | 0.1871 | 0.7263 |
| logistic | MO | 2.0788 | 0.7726 | 0.3716 | 1.0180 | 3.9992 | 0.0101 | 0.1919 | 0.6663 |
| logistic | GR | 1.5652 | 0.6372 | 0.4071 | 0.3846 | 2.8496 | 0.0037 | 0.1400 | 0.4126 |
| triangular | ML | 2.1090 | 0.6463 | 0.3065 | 1.5456 | 4.0769 | 0.0103 | 0.2329 | 0.8122 |
| triangular | MO | 1.9961 | 0.6495 | 0.3254 | 1.1355 | 3.6469 | 2.8402e-04 | 0.1976 | 0.6883 |
| triangular | GR | 1.7570 | 0.5709 | 0.3250 | 0.8041 | 3.0515 | 0 | 0.1665 | 0.5135 |
| gumbel | ML | 2.0170 | 0.6051 | 0.3000 | 1.2862 | 3.7728 | 0.0056 | 0.2468 | 0.7652 |
| gumbel | MO | 2.6702 | 0.6315 | 0.2365 | 1.6893 | 4.2340 | 0.0018 | 0.2431 | 0.9740 |
| gumbel | GR | 2.2479 | 0.5986 | 0.2663 | 1.0068 | 3.2936 | 1.5105e-04 | 0.1662 | 0.8012 |
| burr | ML | 1.6912 | 1.3564 | 0.8020 | 0 | 5.3085 | 0 | 0.2495 | 0.2158 |

ML=maximum likelihood, MO= moment estimators, and GR=graphical methods

LCp and UCp=projections of the confidence limits of the HC05 (LCx and UCx) onto the cumulative distribution function of the fitted distribution.

# Calculation of other quantiles

**Tables 9, 10, and 11** provide estimates of the HC05 as well as other quantiles of the fitted SSDs.

**Table 9. Estimated quantiles of the fitted SSDs for carbaryl LC50s for all aquatic vertebrates.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Distribution | Method | HC05 | 10 | 50 | 90 | 95 |
| normal | ML | 1.1509 | 1.5498 | 4.4272 | 12.6464 | 17.0291 |
| normal | MO | 1.1388 | 1.5370 | 4.4272 | 12.7518 | 17.2115 |
| normal | GR | 1.0631 | 1.4569 | 4.4272 | 13.4532 | 18.4360 |
| logistic | ML | 1.0474 | 1.5077 | 4.3999 | 12.8403 | 18.4823 |
| logistic | MO | 1.1591 | 1.6287 | 4.4272 | 12.0342 | 16.9087 |
| logistic | GR | 1.0388 | 1.5007 | 4.4272 | 13.0605 | 18.8685 |
| triangular | ML | 1.1150 | 1.4439 | 4.2977 | 12.7921 | 16.5649 |
| triangular | MO | 1.1109 | 1.4477 | 4.4272 | 13.5382 | 17.6436 |
| triangular | GR | 1.0716 | 1.4062 | 4.4272 | 13.9378 | 18.2900 |
| gumbel | ML | 1.2705 | 1.5546 | 3.9037 | 16.5538 | 28.7501 |
| gumbel | MO | 1.5069 | 1.7850 | 3.8657 | 12.9962 | 20.6551 |
| gumbel | GR | 1.4071 | 1.6892 | 3.8887 | 14.3887 | 23.7214 |
| burr | ML | 1.2146 | 1.5966 | 4.1772 | 13.7944 | 21.2339 |

**Table 10. Estimated quantiles of the fitted SSDs for carbaryl LC50s for all fish.**

| Distribution | Method | HC05 | 10 | 50 | 90 | 95 |
| --- | --- | --- | --- | --- | --- | --- |
| normal | ML | 1.0668 | 1.4101 | 3.7725 | 10.0927 | 13.3402 |
| normal | MO | 1.0530 | 1.3958 | 3.7725 | 10.1961 | 13.5159 |
| normal | GR | 0.9727 | 1.3122 | 3.7725 | 10.8459 | 14.6312 |
| logistic | ML | 0.9962 | 1.3894 | 3.6957 | 9.8307 | 13.7112 |
| logistic | MO | 1.0707 | 1.4739 | 3.7725 | 9.6560 | 13.2924 |
| logistic | GR | 0.9456 | 1.3434 | 3.7725 | 10.5937 | 15.0502 |
| triangular | ML | 1.0554 | 1.3543 | 3.8789 | 11.1100 | 14.2562 |
| triangular | MO | 1.0287 | 1.3195 | 3.7725 | 10.7860 | 13.8346 |
| triangular | GR | 0.9852 | 1.2741 | 3.7725 | 11.1698 | 14.4460 |
| gumbel | ML | 1.1892 | 1.4333 | 3.3590 | 12.7813 | 21.2979 |
| gumbel | MO | 1.3701 | 1.6065 | 3.3211 | 10.3797 | 16.0432 |
| gumbel | GR | 1.2683 | 1.5099 | 3.3448 | 11.6525 | 18.7730 |
| burr | ML | 1.1573 | 1.4813 | 3.5509 | 10.6042 | 15.7528 |

**Table 11. Estimated quantiles of the fitted SSDs for carbaryl LC50s for all amphibians.**

| Distribution | Method | HC05 | 10 | 50 | 90 | 95 |
| --- | --- | --- | --- | --- | --- | --- |
| normal | ML | 2.1357 | 2.8159 | 7.4669 | 19.8000 | 26.1053 |
| normal | MO | 2.0439 | 2.7211 | 7.4669 | 20.4894 | 27.2777 |
| normal | GR | 1.6808 | 2.3364 | 7.4669 | 23.8627 | 33.1712 |
| logistic | ML | 2.3318 | 3.2107 | 8.2235 | 21.0627 | 29.0014 |
| logistic | MO | 2.0788 | 2.8757 | 7.4669 | 19.3879 | 26.8197 |
| logistic | GR | 1.5652 | 2.3269 | 7.4669 | 23.9610 | 35.6211 |
| triangular | ML | 2.1090 | 2.6696 | 7.2183 | 19.5173 | 24.7048 |
| triangular | MO | 1.9961 | 2.5701 | 7.4669 | 21.6934 | 27.9308 |
| triangular | GR | 1.7570 | 2.3181 | 7.4669 | 24.0514 | 31.7332 |
| gumbel | ML | 2.0170 | 2.5044 | 6.7223 | 31.6521 | 57.2155 |
| gumbel | MO | 2.6702 | 3.1386 | 6.5605 | 20.8640 | 32.4630 |
| gumbel | GR | 2.2479 | 2.7352 | 6.6951 | 27.2761 | 46.6526 |
| burr | ML | 1.6912 | 2.7689 | 8.7949 | 15.9120 | 18.4259 |

# Determination of thresholds

HC05 values from the most appropriate distribution and method were used as the thresholds for fish and amphibians. The threshold for all fish is the HC05 value 1.0554 mg ai/L, based on the triangular distribution and maximum likelihood (ML) method. The triangular distribution with the ML method was chosen as the most appropriate distribution and method for all fish because it had the highest P-value (0.4795), the highest weight (0.5213), the tightest confidence intervals around the HC05, as well as having a good fit within the confidence intervals on the distribution plot. The threshold for all amphibians is the HC05 value 2.3318 mg ai/L, based on the logistic distribution and ML method. The logistic distribution with the ML method was chosen as the most appropriate distribution and method for all amphibians because it had a high P-value (0.7263) and provided the best fit within the confidence intervals of the distribution plot.

**Tables 12, 13** and **14** provide all of the available LC50 values for fish and amphibians, respectively (within the 96-hour timeframe-unless otherwise noted). These data sets are the same as reported in the effects characterization and provide additional data for the formulated products. Values that were included in the SSD (*i.e.,* TGAI) are marked with an \*.

Table 12. Available acute (4-d) median lethal concentration (LC50) data for fish exposed to carbaryl as TGAI.

| **Genus** | **Species** | **Common Name** | **LC50 (mg/L)1** | **Reference #** |
| --- | --- | --- | --- | --- |
| *Pimephales* | *promelas* | Fathead Minnow | 10.4\* | E12859 (NR) |
| *Pimephales* | *promelas* | Fathead Minnow | 8.93\* | E12859 |
| *Pimephales* | *promelas* | Fathead Minnow | 9.47\* | E12859 |
| *Pimephales* | *promelas* | Fathead Minnow | 6.67\* | E12859 |
| *Mystus* | *vittatus* | Striped Catfish | 11.5\* | E87812 |
| *Channa* | *punctata* | Snake-Head Catfish | 4.957\* | E17200 (JV) |
| *Macropodus* | *cupanus* | Paradise Fish | 14.54\* | E87644 (JV) |
| *Oncorhynchus* | *kisutch* | Silver Salmon | 0.997\* | E522 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.35\* | E522 |
| *Gasterosteus* | *aculeatus* | Threespine Stickleback | 3.99\* | E522 |
| *Gasterosteus* | *aculeatus* | Threespine Stickleback | 3.99\* | E522 |
| *Poecilia* | *reticulata* | Guppy | 2.5\* | E18726 |
| *Danio* | *rerio* | Zebra Danio | 9.25\* | E18726 |
| *Pimephales* | *promelas* | Fathead Minnow | 5.21\* | E81380 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.88\* | E81380 |
| *Acipenser* | *brevirostrum* | Shortnose Sturgeon | 1.81\* | E81380 |
| *Xyrauchen* | *texanus* | Razorback Sucker | 4.35\* | E81380 |
| *Gila* | *elegans* | Bonytail | 3.49\* | E81380 |
| *Notropis* | *mekistocholas* | Cape Fear Shiner | 4.51\* | E81380 |
| *Ptychocheilus* | *lucius* | Colorado Squawfish | 3.07\* | E81380 |
| *Erimonax* | *monachus* | Spotfin Chub | 3.41\* | E81380 |
| *Etheostoma* | *lepidum* | Greenthroat Darter | 2.14\* | E81380 |
| *Poeciliopsis* | *occidentalis* | Gila Topminnow | 3 | E81380 |
| *Oncorhynchus* | *gilae ssp. apache* | Apache Trout | 1.54\* | E81380 |
| *Oncorhynchus* | *clarkii ssp. stomias* | Greenback Cutthroat Trout | 1.55\* | E81380 |
| *Oncorhynchus* | *clarkii ssp. henshawi* | Lahontan Cutthroat Trout | 2.25\* | E81380 |
| *Cyprinodon* | *variegatus* | Sheepshead Minnow | 4.36\* | E81380 |
| *Cyprinodon* | *macularius* | Desert Pupfish | 7.71\* | E81380 |
| *Cyprinodon* | *bovinus* | Leon Springs Pupfish | 4.54\* | E81380 |
| *Acipenser* | *oxyrhynchus* | Atlantic Sturgeon | 0.8 | E81380 |
| *Etheostoma* | *fonticola* | Fountain Darter | 2.02\* | E81380 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.8943\* | E65396 |
| *Oncorhynchus* | *gilae ssp. apache* | Apache Trout | 1.4955\* | E65396 |
| *Oncorhynchus* | *clarkii ssp. stomias* | Greenback Cutthroat Trout | 1.5952\* | E65396 |
| *Oncorhynchus* | *clarkii ssp. henshawi* | Lahontan Cutthroat Trout | 2.2931\* | E65396 |
| *Pimephales* | *promelas* | Fathead Minnow | 5.1844\* | E65396 |
| *Gila* | *elegans* | Bonytail | 3.4895\* | E65396 |
| *Ptychocheilus* | *lucius* | Colorado Squawfish | 3.0907\* | E65396 |
| *Xyrauchen* | *texanus* | Razorback Sucker | 4.3868\* | E65396 |
| *Cyprinodon* | *variegatus* | Sheepshead Minnow | 4.3868\* | E65396 |
| *Cyprinodon* | *bovinus* | Leon Springs Pupfish | 4.4865\* | E65396 |
| *Cyprinodon* | *macularius* | Desert Pupfish | 7.1784 | E65396 (AD) |
| *Salvelinus* | *namaycush* | Lake Trout, Siscowet | 0.74\* | E6797 |
| *Salvelinus* | *namaycush* | Lake Trout, Siscowet | 0.92\* | E6797 |
| *Salvelinus* | *namaycush* | Lake Trout, Siscowet | 0.872\* | E6797 |
| *Salvelinus* | *namaycush* | Lake Trout, Siscowet | 2.3\* | E6797 |
| *Carassius* | *auratus* | Goldfish | 13.2\* | E6797 |
| *Carassius* | *auratus* | Goldfish | 12.8\* | E6797 |
| *Cyprinus* | *carpio* | Common Carp | 5.28\* | E6797 |
| *Pimephales* | *promelas* | Fathead Minnow | 14\* | E6797 |
| *Pimephales* | *promelas* | Fathead Minnow | 14.6\* | E6797 |
| *Pimephales* | *promelas* | Fathead Minnow | 7.7\* | E6797 |
| *Ameiurus* | *melas* | Black Bullhead | 20\* | E6797 (FI) |
| *Ictalurus* | *punctatus* | Channel Catfish | 15.8\* | E6797 |
| *Ictalurus* | *punctatus* | Channel Catfish | 7.79\* | E6797 |
| *Ictalurus* | *punctatus* | Channel Catfish | 17.3\* | E6797 (FI) |
| *Lepomis* | *cyanellus* | Green Sunfish | 11.2\* | E6797 |
| *Lepomis* | *cyanellus* | Green Sunfish | 9.46\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 6.76\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 5.23\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 5.047\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 7.4\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 5.2\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 16\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 7\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 8.2\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 6.2\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 5.4\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 5.2\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 1.8\* | E6797 |
| *Lepomis* | *macrochirus* | Bluegill | 2.6\* | E6797 |
| *Micropterus* | *salmoides* | Largemouth Bass | 6.4\* | E6797 |
| *Pomoxis* | *nigromaculatus* | Black Crappie | 2.6\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 0.745\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 5.1\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 13.9\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 5.4\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 3.4\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 1.2\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 4\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 4.2\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 0.48\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 0.35\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 3.8\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 5\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 3.75\* | E6797 |
| *Perca* | *flavescens* | Yellow Perch | 1.42\* | E6797 (FI) |
| *Oncorhynchus* | *kisutch* | Silver Salmon | 4.34\* | E6797 |
| *Oncorhynchus* | *kisutch* | Silver Salmon | 2.4\* | E6797 |
| *Oncorhynchus* | *kisutch* | Silver Salmon | 1.75\* | E6797 |
| *Oncorhynchus* | *kisutch* | Silver Salmon | 2.7\* | E6797 |
| *Oncorhynchus* | *kisutch* | Silver Salmon | 1.15\* | E6797 |
| *Oncorhynchus* | *tshawytscha\** | Chinook Salmon | 2.4 | E6797 (FI) |
| *Oncorhynchus* | *clarkii* | Cutthroat Trout | 7.1\* | E6797 |
| *Oncorhynchus* | *clarkii* | Cutthroat Trout | 6 | E6797 |
| *Oncorhynchus* | *clarkii* | Cutthroat Trout | 5\* | E6797 |
| *Oncorhynchus* | *clarkii* | Cutthroat Trout | 0.97\* | E6797 |
| *Oncorhynchus* | *clarkii* | Cutthroat Trout | 3.95\* | E6797 |
| *Oncorhynchus* | *clarkii* | Cutthroat Trout | 6.8\* | E6797 |
| *Oncorhynchus* | *clarkii* | Cutthroat Trout | 4\* | E6797 |
| *Oncorhynchus* | *clarkii* | Cutthroat Trout | 3.38\* | E6797 |
| *Oncorhynchus* | *clarkii* | Cutthroat Trout | 2.3\* | E6797 |
| *Oncorhynchus* | *clarkii* | Cutthroat Trout | 6.7\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.95\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.2\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.36\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 2.08\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.9\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 2.3\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.33\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 0.75 | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 0.32 | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.09\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.46\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 3.5\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 3\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.6\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.1\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.2\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 0.78\* | E6797 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.45\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 4.5\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 2.07\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 1.18\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 1.27\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 0.905\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 2.01\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 1.43\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 0.5\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 1\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 1.15\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 1.1\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 1.35\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 0.25\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 0.9\* | E6797 |
| *Salmo* | *salar* | Atlantic Salmon | 1\* | E6797 |
| *Salmo* | *trutta* | Brown Trout | 6.3\* | E6797 |
| *Salmo* | *trutta* | Brown Trout | 2\* | E6797 (FI) |
| *Salvelinus* | *fontinalis* | Brook Trout | 2.1\* | E6797 (FI) |
| *Salvelinus* | *fontinalis* | Brook Trout | 3\* | E6797 |
| *Salvelinus* | *fontinalis* | Brook Trout | 0.68\* | E6797 |
| *Salvelinus* | *fontinalis* | Brook Trout | 4.56\* | E6797 |
| *Salvelinus* | *fontinalis* | Brook Trout | 2.13\* | E6797 |
| *Salvelinus* | *fontinalis* | Brook Trout | 1.13\* | E6797 |
| *Salvelinus* | *fontinalis* | Brook Trout | 1.2\* | E6797 |
| *Salvelinus* | *fontinalis* | Brook Trout | 1.29\* | E6797 |
| *Salvelinus* | *namaycush* | Lake Trout, Siscowet | 0.69\* | E6797 |
| *Terapon* | *jarbua* | Tigerfish | 2.2\* | E6797 |
| *Morone* | *saxatilis* | Striped Bass | 0.76\* | E11334 |
| *Morone* | *saxatilis* | Striped Bass | 2.3\* | E11334 |
| *Ictalurus* | *punctatus* | Channel Catfish | 1.3\* | E5722 |
| *Ictalurus* | *punctatus* | Channel Catfish | 0.14\* | E5722 |
| *Ictalurus* | *punctatus* | Channel Catfish | 1.56\* | E5722 |
| *Poecilia* | *reticulata* | Guppy | 4.7\* | E6191 |
| *Clarias* | *batrachus* | Walking Catfish | 46.85 | E13053 |
| *Clarias* | *batrachus* | Walking Catfish | 107.66 | E13053 |
| *Anabas* | *testudineus* | Climbing Perch | 5.5\* | E4969 |
| *Gibelion* | *catla* | Catla | 6.4\* | E4969 |
| *Mystus* | *vittatus* | Striped Catfish | 2.4\* | E4969 |
| *Mystus* | *cavasius* | Catfish | 4.6\* | E4969 |
| *Oncorhynchus* | *clarkii* | Cutthroat Trout | 5.94\* | E5618 |
| *Poecilia* | *reticulata* | Guppy | 6.435\* | E5370 |
| *Colisa* | *fasciata* | Giant Gourami | 8 | E74220 (AD) |
| *Clarias* | *batrachus* | Walking Catfish | 1188 | E13614 |
| *Heteropneustes* | *fossilis* | Indian Catfish | 1188 | E13614 |
| *Clarias* | *batrachus* | Walking Catfish | 16.27 | E82520 (AD) |
| *Gambusia* | *affinis* | Western Mosquitofish | 204 | E5806 (AD) |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 2.8017\* | E12182 |
| *Cyprinus* | *carpio* | Common Carp | 1.19 | E6999 (EG) |
| *Cyprinus* | *carpio* | Common Carp | 2.86\* | E6999 (LV) |
| *Cyprinus* | *carpio* | Common Carp | 3.3\* | E6999 (FY) |
| *Gila* | *elegans* | Bonytail | 2.02\* | E13270 (LV) |
| *Ptychocheilus* | *lucius* | Colorado Squawfish | 1.31\* | E13270 (LV) |
| *Leuciscus* | *cephalus* | Chub | 8.2232\* | E104627 |
| *Etheostoma* | *rubrum* | Bayou Darter | 2.01394\* | E56161 (FY) |
| *Etheostoma* | *lepidum* | Greenthroat Darter | 2.13358\* | E56161 (FY) |
| *Poeciliopsis* | *occidentalis* | Gila Topminnow | 2.991 | E56161 (FY) |
| *Scaphirhynchus* | *platorynchus* | Shovelnose Sturgeon | 1.2961 | E56161 (FY) |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 5.346\* | E80949 (JV) |
| *Clarias* | *batrachus* | Walking Catfish | 28\* | E88885 |
| *Clarias* | *batrachus* | Walking Catfish | 15.3\* | E112237 |
| *Cyprinodon* | *variegatus* | Sheepshead Minnow | 5.742\* | E115739 |
| *Menidia* | *beryllina* | Inland Silverside | 1.584\* | E115739 |
| *Carassius* | *auratus* | Goldfish | 13.761\* | E73465 (JV) |
| *Oncorhynchus* | *clarkii ssp. stomias* | Greenback Cutthroat Trout | 1.54535\* | E73668 |
| *Oncorhynchus* | *clarkii ssp. henshawi* | Lahontan Cutthroat Trout | 1.994\* | E73668 |
| *Oncorhynchus* | *clarkii ssp. henshawi* | Lahontan Cutthroat Trout | 2.52241\* | E73668 |
| *Pimephales* | *promelas* | Fathead Minnow | 4.36686\* | E73668 |
| *Pimephales* | *promelas* | Fathead Minnow | 5.84242\* | E73668 |
| *Pimephales* | *promelas* | Fathead Minnow | 7.40771\* | E73668 |
| *Pimephales* | *promelas* | Fathead Minnow | 3.92818\* | E73668 |
| *Pimephales* | *promelas* | Fathead Minnow | 5.22428\* | E73668 |
| *Pimephales* | *promelas* | Fathead Minnow | 5.70284\* | E73668 |
| *Gila* | *elegans* | Bonytail | 3.56926\* | E73668 |
| *Gila* | *elegans* | Bonytail | 3.3898\* | E73668 |
| *Ptychocheilus* | *lucius* | Colorado Squawfish | 2.31304\* | E73668 |
| *Ptychocheilus* | *lucius* | Colorado Squawfish | 4.04782\* | E73668 |
| *Xyrauchen* | *texanus* | Razorback Sucker | 4.40674\* | E73668 |
| *Xyrauchen* | *texanus* | Razorback Sucker | 4.27713\* | E73668 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.994\* | E73668 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.23628\* | E73668 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 2.25322\* | E73668 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.21634\* | E73668 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 2.06379\* | E73668 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 3.10067\* | E73668 |
| *Oncorhynchus* | *gilae ssp. apache* | Apache Trout | 1.64505\* | E73668 |
| *Oncorhynchus* | *gilae ssp. apache* | Apache Trout | 1.42571\* | E73668 |
| *Acipenser* | *brevirostrum* | Shortnose Sturgeon | 1.949\* | E153255 |
| *Pimephales* | *promelas* | Fathead Minnow | 5.171\* | E153255 |
| *Gila* | *elegans* | Bonytail | 3.044\* | E153255 |
| *Notropis* | *mekistocholas* | Cape Fear Shiner | 4.264\* | E153255 |
| *Ptychocheilus* | *lucius* | Colorado Squawfish | 3.083\* | E153255 |
| *Erimonax* | *monachus* | Spotfin Chub | 3.416\* | E153255 |
| *Xyrauchen* | *texanus* | Razorback Sucker | 4.325\* | E153255 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.866\* | E153255 |
| *Oncorhynchus* | *gilae ssp. apache* | Apache Trout | 1.435\* | E153255 |
| *Oncorhynchus* | *clarkii ssp. stomias* | Greenback Cutthroat Trout | 1.553\* | E153255 |
| *Oncorhynchus* | *clarkii ssp. henshawi* | Lahontan Cutthroat Trout | 2.221\* | E153255 |
| *Cyprinodon* | *variegatus* | Sheepshead Minnow | 4.362\* | E153255 |
| *Cyprinodon* | *variegatus* | Sheepshead Minnow | 2.511\* | E153255 |
| *Cyprinodon* | *macularius* | Desert Pupfish | 7.714\* | E153255 |
| *Cyprinodon* | *bovinus* | Leon Springs Pupfish | 2.017\* | E153255 |
| *Cyprinodon* | *bovinus* | Leon Springs Pupfish | 4.54\* | E153255 |
| *Poeciliopsis* | *occidentalis* | Gila Topminnow | 3 | E153255 |
| *Etheostoma* | *fonticola* | Fountain Darter | 1.615\* | E153255 |
| *Etheostoma* | *lepidum* | Greenthroat Darter | 2.143\* | E153255 |
| *Pimephales* | *Pimephales* | Fathead Minnow | 1.6 | E5313 (LV/EM) |
| *Labeo* | *rohita* | Rohu | 8.24\* | E171559 (FI) |
| *Channa* | *orientalis* | Smooth-Breasted Snakefish | 1.675\* | E171574 |
| *Pimephales* | *Pimephales* | Fathead Minnow | 7.7\* | MRID 40098001 |
| *Salmo* | *salar* | Atlantic Salmon | 0.5\* | MRID 40098001 |
| *Cyprinodon* | *variegatus* | Sheepshead Minnow | 2.6\* | MRID 42372801 |
| *Oncorhynchus* | *kisutch* | Coho Salmon | 4.34\* | MRID 40094602 |
| *Oncorhynchus* | *tshawytscha* | Chonook Salmon | 2.4\* | MRID 40094602 |
| *Oncorhynchus* | *clarkii* | Cutthroat trout | 7.1\* | MRID 40094602 |
| *Oncorhynchus* | *mykiss* | Rainbow trout | 1.95\* | MRID 40094602 |
| *Salmo* | *salar* | Atlantic Salmon | 4.5\* | MRID 40094602 |
| *Salmo* | *trutta* | Brown trout | 6.3\* | MRID 40094602 |
| *Salvelinus* | *fontinalis* | Brook trout | 2.1\* | MRID 40094602 |
| *Salvelinus* | *namaycush* | Lake Trout, Siscowet | 0.69\* | MRID 40094602 |
| *Carassius* | *auratus* | Goldfish | 13.2\* | MRID 40094602 |
| *Cyprinus* | *carpio ssp. communis* | Carp | 5.28\* | MRID 40094602 |
| *Pimephales* | *Pimephales* | Fathead Minnow | 14.6\* | MRID 40094602 |
| *Ameiurus* | *melas* | Black Bullhead | 20\* | MRID 40094602 |
| *Ictalurus* | *punctatus* | Channel Catfish | 15.8\* | MRID 40094602 |
| *Lepomis* | *cyanellus* | Green Sunfish | 11.2\* | MRID 40094602 |
| *Lepomis* | *macrochirus* | Bluegill | 6.76\* | MRID 40094602 |
| *Micropterus* | *salmoides* | Largemouth bass | 6.4\* | MRID 40094602 |
| *Pomoxis* | *nigromaculatus* | Black crappie | 2.6\* | MRID 40094602 |
| *Perca* | *flavescens* | Yellow perch | 5.1\* | MRID 40094602 |
| *Salvelinus* | *fontinalis* | Brook trout | 4.5\* | MRID 40094602 |
| *Lepomis* | *macrochirus* | Bluegill | 39 | MRID 40094602 |
| *Oncorhynchus* | *mykiss* | Rainbow trout | 0.78\* | MRID 40098001 |
| *Lepomis* | *macrochirus* | Bluegill | 14\* | TN 142 |
| *Cyprinodon* | *variegatus* | Sheepshead Minnow | 2.2\* | MRID 00150539 |
| *Cyprinodon* | *variegatus* | Sheepshead Minnow | 2.6\* | MRID 42372801 |
| *Lepomis* | *macrochirus* | Bluegill | 14\* | MRID 00043115 |

\* Indicates study was conducted with TGAI and value used to derive SSD.

1If a species was not represented with a 96 hour study, and other values were available from shorter/longer duration studies (up to 10 days) then the data were included and the duration was listed next to the LC50 value as an indicator. If there were multiple other durations, the value from the study closer to a 96h duration was selected and if there were multiple values for the same duration, the range is indicated.

Table 13. Available acute (4-d) median lethal concentration (LC50) data for fish exposed to carbaryl as formulation.

| **Genus** | **Species** | **Common Name** | **LC50 (mg/L)** | **Reference #** |
| --- | --- | --- | --- | --- |
| *Heteropneustes* | *fossilis* | Indian Catfish | 9.79 | E15179 |
| *Pimephales* | *promelas* | Fathead Minnow | 9 | E5073 |
| *Lepomis* | *macrochirus* | Bluegill | 39 | E6797 |
| *Salvelinus* | *fontinalis* | Brook Trout | 4.5 | E6797 |
| *Cyprinus* | *carpio* | Common Carp | 6.6725 | E87858 (FY) |
| *Oreochromis* | *niloticus* | Nile Tilapia | 8.5 | E3296 |
| *Ptychocheilus* | *lucius* | Colorado Squawfish | 3.18 | E13270 (LV) |
| *Gila* | *elegans* | Bonytail | 3.31 | E13270 (LV) |
| *Heteropneustes* | *fossilis* | Indian Catfish | 29 | E94525 |
| *Mystus* | *tengara* | Catfish | 9 | E94525 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 0.4437 | E112236 |
| *Poecilia* | *reticulata* | Guppy | 1.17555 | E112236 |
| *Clarias* | *batrachus* | Walking Catfish | 10 | E96478 |
| *Clarias* | *batrachus* | Walking Catfish | 5.248 | E120903 |
| *Oncorhynchus* | *mykiss* | Rainbow Trout | 1.39 | E150853(JV) |
| *Lepomis* | *macrochirus* | Bluegill | 49 | MRID 00059202 |
| *Oncorhynchus* | *mykiss* | Rainbow trout | 32 | TN 767 |
| *Oncorhynchus* | *mykiss* | Rainbow trout | 4 | TN 407 |
| *Oncorhynchus* | *mykiss* | Rainbow trout | 4.55 | TN 468 |
| *Lepomis* | *macrochirus* | Bluegill | 22 | TN 450 |
| *Lepomis* | *macrochirus* | Bluegill | 24 | TN 445 |
| *Oncorhynchus* | *mykiss* | Rainbow trout | 1.4 | MRID 00151417 |
| *Lepomis* | *macrochirus* | Bluegill | 9.8 | MRID 00151519 |
| *Oncorhynchus* | *mykiss* | Rainbow trout | 3.3 | MRID 42397901 |
| *Oncorhynchus* | *mykiss* | Rainbow trout | 1.3 | TN 89 |
| *Oncorhynchus* | *mykiss* | Rainbow trout | 3.45 | TN 413 |
| *Cyprinodon* | *variegatus* | Sheepshead Minnow | 5.9 | MRID 42343001 |
| *Lepomis* | *macrochirus* | Bluegill | 290 | MRID 00042381 |

Table 14. Available acute (4-d) median lethal concentration (LC50) data for aquatic-phase amphibians exposed to carbaryl.

| **Genus** | **Species** | **Common Name** | **LC50 (mg/L)1** | **Reference #** |
| --- | --- | --- | --- | --- |
| *Hoplobatrachus* | *tigerinus* | Indian Bullfrog | 6.2\* | E10697 |
| *Hoplobatrachus* | *tigerinus* | Indian Bullfrog | 6.3\* | E10697 |
| *Hoplobatrachus* | *tigerinus* | Indian Bullfrog | 11.7\* | E10697 |
| *Euphlyctis* | *hexadactylus* | True Frog | 55.34 | E11521 |
| *Xenopus* | *laevis* | African Clawed Frog | 1.73\* | E15683 |
| *Hyla* | *versicolor* | Gray Tree Frog | 2.47\* | E15683 |
| *Xenopus* | *laevis* | African Clawed Frog | 15.25 | E15683 |
| *NR* | *Anura* | Frog and Toad Order | 2.1 | E20421 |
| *Lithobates* | *clamitans ssp.* | Bronze Frog | 11.32\* | E47680 |
| *Lithobates* | *clamitans ssp.* | Bronze Frog | 17.36\* | E47680 |
| *Lithobates* | *clamitans ssp.* | Bronze Frog | 22.02\* | E47680 |
| *Anaxyrus* | *boreas* | Western Toad | 12.31\* | E56161 |
| *Hoplobatrachus* | *tigerinus* | Indian Bullfrog | 5.68\* | E65895 |
| *Lithobates* | *sphenocephalus* | Florida Leopard Frog | 8.4\* | E72411 |
| *Rhinella* | *arenarum* | Toad | 24.64\* | E80949 |
| *Bufo* | *boreas* | Boreal Toad | 12.3\* | E81380 |
| *Rana* | *boylii* | Foothill Yellow-Legged Frog | 0.58493\* | E118706 |
| *Pseudacris* | *regilla* | Pacific Chorus Frog | 3.00651\* | E118706 |
| *Rana* | *boylii* | Foothill Yellow-Legged Frog | 4.592\* | E153255 |
| *Hyla* | *versicolor* | Gray Tree Frog | 6.214\* | E153255 |
| *Lithobates* | *sphenocephalus* | Florida Leopard Frog | 7.964\* | E153255 |
| *Ambystoma* | *maculatum* | Spotted Salamander | 8.034\* | E153255 |
| *Lithobates* | *clamitans* | Bronze Frog | 9.523\* | E153255 |
| *Rana* | *pretiosa* | Oregon Spotted Frog | 9.632\* | E153255 |
| *Lithobates* | *blairi* | Plains Leopard Frog | 11.477\* | E153255 |
| *Lithobates* | *palustris* | Pickeral Frog | 11.487\* | E153255 |
| *Rana* | *catesbeiana* | Bullfrog | 11.83\* | E153255 |
| *Anaxyrus* | *boreas* | Western Toad | 12.303\* | E153255 |
| *Bombina* | *orientalis* | Oriental Fire-Bellied Toad | 20.1 | E171598 |

\* Indicates study was conducted with TGAI and value used to derive SSD.

1If a species was not represented with a 96 hour study, and other values were available from shorter/longer duration studies (up to 10 days) then the data were included and the duration was listed next to the LC50 value as an indicator. If there were multiple other durations, the value from the study closer to a 96h duration was selected and if there were multiple values for the same duration, the range is indicated.