

## Appendix L. Sensitivity Distribution Data

Tables L.1-L.4 contain the 96-hour LC<sub>50</sub> data for fish and associated calculations used to derive the species sensitivity distribution discussed in the risk assessment. Tables F.5-F.8 contain the 48 to 96-hour EC<sub>50</sub> data for invertebrates and associated calculations used to derive the species sensitivity distribution for aquatic vertebrates. Tables F.9-F.12 contain LD<sub>50</sub> data for birds and associated calculations used to derive the species sensitivity distribution for birds.

| Table L.1. Summary of 96 hour LC50 data for effects of diazinon on freshwater fish. |                               |                 |             |                      |                 |               |              |
|-------------------------------------------------------------------------------------|-------------------------------|-----------------|-------------|----------------------|-----------------|---------------|--------------|
| Common Name                                                                         | Species Name                  | Mean LC50 (ppb) | Log 10 LC50 | Test Subst. (% a.i.) | MRID/ Accession | ECOTOX Number | Comments     |
| Bluegill sunfish                                                                    | <i>Lepomis macrochirus</i>    | 136             | 2.134       | 91.0                 | 104923          | NA            | cited in RED |
| Bluegill sunfish                                                                    | <i>Lepomis macrochirus</i>    | 460             | 2.663       | 92.5                 | ROODI007        | NA            | cited in RED |
| Bluegill sunfish                                                                    | <i>Lepomis macrochirus</i>    | 168             | 2.225       | 92.0                 | 40094602        | NA            | cited in RED |
| Brook trout                                                                         | <i>Salelinus fontinalis</i>   | 770             | 2.886       | 92.5                 | ROODI007        | NA            | cited in RED |
| Cutthroat trout                                                                     | <i>Oncorhynchus clarki</i>    | 1700            | 3.230       | 92.0                 | 40094602        | NA            | cited in RED |
| Fathead Minnow                                                                      | <i>Pimephales promelas</i>    | 7800            | 3.892       | 92.5                 | ROODI007        | NA            | cited in RED |
| Flagfish                                                                            | <i>Jordanella floridae</i>    | 1600            | 3.204       | 92.5                 | ROODI007        | NA            | cited in RED |
| Guppy                                                                               | <i>Lebistes reticulatus</i>   | 1100            | 3.041       | NR                   | 5000811         | NA            | cited in RED |
| Lake trout                                                                          | <i>Salvelinus namaychus</i>   | 602             | 2.780       | 92.0                 | 40094602        | NA            | cited in RED |
| Rainbow trout                                                                       | <i>Oncorhynchus gairdneri</i> | 90              | 1.954       | 89.0                 | 40094602        | NA            | cited in RED |
| Rainbow trout                                                                       | <i>Oncorhynchus sp.</i>       | 400             | 2.602       | 91.0                 | 104923          | NA            | cited in RED |
| NR = not reported, NA = not applicable                                              |                               |                 |             |                      |                 |               |              |

| Table L.2. Species Mean Acute Values (SMAVs) for freshwater fish. |                               |            |
|-------------------------------------------------------------------|-------------------------------|------------|
| Common Name                                                       | Species Name                  | Log10 SMAV |
| Bluegill sunfish                                                  | <i>Lepomis macrochirus</i>    | 2.3405     |
| Brook trout                                                       | <i>Salelinus fontinalis</i>   | 2.8865     |
| Cutthroat trout                                                   | <i>Oncorhynchus clarki</i>    | 3.2304     |
| Fathead Minnow                                                    | <i>Pimephales promelas</i>    | 3.8921     |
| Flagfish                                                          | <i>Jordanella floridae</i>    | 3.2041     |
| Guppy                                                             | <i>Lebistes reticulatus</i>   | 3.0414     |
| Lake trout                                                        | <i>Salevelinus namaychus</i>  | 2.7796     |
| Rainbow trout                                                     | <i>Oncorhynchus gairdneri</i> | 1.954      |
| Rainbow trout                                                     | <i>Oncorhynchus sp.</i>       | 2.602      |

| Table L.3. Genus Mean Acute Values (GMAVs) for freshwater fish. |                     |            |           |                  |               |
|-----------------------------------------------------------------|---------------------|------------|-----------|------------------|---------------|
| Common Name                                                     | Species Name        | Log10 GMAV | GMAV LC50 | Sensitivity Rank | Rank on curve |
| sunfish                                                         | <i>Lepomis</i>      | 2.3405     | 219       | 1                | 0.00          |
| Brook trout                                                     | <i>Salelinus</i>    | 2.8865     | 770       | 4                | 0.50          |
| Trout                                                           | <i>Oncorhynchus</i> | 2.5956     | 394       | 2                | 0.17          |
| Fathead Minnow                                                  | <i>Pimephales</i>   | 3.8921     | 7800      | 7                | 1.00          |
| Flagfish                                                        | <i>Jordanella</i>   | 3.2041     | 1600      | 6                | 0.83          |
| Guppy                                                           | <i>Lebistes</i>     | 3.0414     | 1100      | 5                | 0.67          |
| Lake trout                                                      | <i>Salevelinus</i>  | 2.7796     | 602       | 3                | 0.33          |
| Genus Mean for All:                                             |                     | 2.9628     | 1784      |                  |               |
| Genus Standard Deviation for all:                               |                     | 0.4982     | 2693      |                  |               |

| Table L.4. Calculation of species sensitivity distribution curve for freshwater fish. |                |             |                |
|---------------------------------------------------------------------------------------|----------------|-------------|----------------|
| Proportion                                                                            | Z <sub>p</sub> | Log10 point | Point Estimate |
| 0.05                                                                                  | -1.645         | 2.143229    | 139            |
| 0.10                                                                                  | -1.282         | 2.324089    | 211            |
| 0.20                                                                                  | -0.842         | 2.543314    | 349            |
| 0.25                                                                                  | -0.675         | 2.626761    | 423            |
| 0.30                                                                                  | -0.524         | 2.701754    | 503            |
| 0.40                                                                                  | -0.253         | 2.836776    | 687            |
| 0.50                                                                                  | 0              | 2.962831    | 918            |
| 0.60                                                                                  | 0.253          | 3.088885    | 1227           |
| 0.70                                                                                  | 0.524          | 3.223907    | 1675           |
| 0.75                                                                                  | 0.675          | 3.299141    | 1991           |
| 0.80                                                                                  | 0.842          | 3.382347    | 2412           |
| 0.90                                                                                  | 1.282          | 3.601572    | 3996           |
| 0.95                                                                                  | 1.645          | 3.782432    | 6059           |
| Z <sub>p</sub> = (Log10 LC50 - fish mean GMAV)/(fish std GMAV)                        |                |             |                |

**Table L.5. Summary of 48-96 hour EC50 data for effects of diazinon on freshwater invertebrates.**

| Common Name     | Species Name                   | Mean EC50 (ppb) | Log 10 EC50 | Test Substance (% a.i.) | MRID     | ECOTOX Number | Comments                               |
|-----------------|--------------------------------|-----------------|-------------|-------------------------|----------|---------------|----------------------------------------|
| waterflea       | <i>Ceriodaphnia dubia</i>      | 0.21            | -0.678      | NA                      |          | 76752         |                                        |
| waterflea       | <i>Ceriodaphnia dubia</i>      | 0.45            | -0.347      | NA                      |          | 76752         |                                        |
| daphnid         | <i>Simocephalus serrulatus</i> | 1.34            | 0.127       | 89.0                    | 40094602 | NA            | cited in RED, updated by 10-5-05 memo* |
| daphnid         | <i>Simocephalus serrulatus</i> | 1.67            | 0.223       |                         |          | NA            | cited in 10-5-05 memo*                 |
| daphnid         | <i>Daphnia pulex</i>           | 0.79            | -0.102      | 89.0                    | 40094602 | NA            | cited in RED, updated by 10-5-05 memo* |
| daphnid         | <i>Daphnia magna</i>           | 0.83            | -0.081      | >89.0                   | 109022   | NA            | cited in RED                           |
| mosquito larvae | <i>Culex pipiens fatigans</i>  | 35.0            | 1.544       | NR                      | 5000811  | NA            | cited in RED                           |
| scud            | <i>Gammarus fasciatus</i>      | 2.0             | 0.299       | 89.0                    | 40094602 | NA            | cited in RED, updated by 10-5-05 memo* |
| stonefly        | <i>Pteronarcys californica</i> | 20.49           | 1.312       | 89.0                    | 40094602 | NA            | cited in RED, updated by 10-5-05 memo* |

NR = not reported, NA = not applicable

**Table L.6. Species Mean Acute Values (SMAVs) for freshwater invertebrates.**

| Common Name     | Species Name                  | Log10 SMAV |
|-----------------|-------------------------------|------------|
| waterflea       | <i>Ceriodaphnia dubia</i>     | -0.512     |
| daphnid         | <i>Simocephalus sp.</i>       | 0.1749     |
| daphnid         | <i>Daphnia pulex</i>          | -0.1024    |
| daphnid         | <i>Daphnia magna</i>          | -0.0809    |
| mosquito larvae | <i>Culex pipiens fatigans</i> | 1.5441     |
| scud            | <i>Gammarus fasciatus</i>     | 0.2989     |
| stonefly        | <i>Pteronarcys sp.</i>        | 1.3115     |

| <b>Table L.7. Genus Mean Acute Values (GMAVs) for freshwater invertebrates.</b> |                           |                   |                  |                         |                      |
|---------------------------------------------------------------------------------|---------------------------|-------------------|------------------|-------------------------|----------------------|
| <b>Common Name</b>                                                              | <b>Species Name</b>       | <b>Log10 GMAV</b> | <b>GMAV EC50</b> | <b>Sensitivity Rank</b> | <b>Rank on curve</b> |
| waterflea                                                                       | <i>Ceriodaphnia dubia</i> | <b>-0.512</b>     | 0.31             | 1                       | 0.00                 |
| daphnid                                                                         | <i>Simocephalus</i>       | 0.1749            | 1.50             | 3                       | 0.40                 |
| daphnid                                                                         | <i>Daphnia</i>            | -0.0916           | 0.81             | 2                       | 0.20                 |
| mosquito larvae                                                                 | <i>Culex</i>              | 1.5441            | 35.00            | 6                       | 1.00                 |
| scud                                                                            | <i>Gammarus</i>           | 0.2989            | 1.99             | 4                       | 0.60                 |
| stonefly                                                                        | <i>Pteronarcys</i>        | 1.3115            | 20.49            | 5                       | 0.80                 |
| Genus Mean for All:                                                             |                           | <b>0.4542</b>     | <b>10</b>        |                         |                      |
| Genus Standard Deviation for all:                                               |                           | <b>0.8071</b>     | <b>14</b>        |                         |                      |

| <b>Table L.8. Calculation of species sensitivity distribution curve for freshwater invertebrates.</b> |                      |                    |                       |
|-------------------------------------------------------------------------------------------------------|----------------------|--------------------|-----------------------|
| <b>Proportion</b>                                                                                     | <b>Z<sub>p</sub></b> | <b>Log10 point</b> | <b>Point Estimate</b> |
| 0.05                                                                                                  | -1.645               | -0.87343           | 0.13                  |
| 0.10                                                                                                  | -1.282               | -0.58046           | 0.26                  |
| 0.20                                                                                                  | -0.842               | -0.22533           | 0.60                  |
| 0.25                                                                                                  | -0.675               | -0.09016           | 0.81                  |
| 0.30                                                                                                  | -0.524               | 0.031322           | 1.07                  |
| 0.40                                                                                                  | -0.253               | 0.250045           | 1.78                  |
| 0.50                                                                                                  | 0                    | 0.45424            | 2.85                  |
| 0.60                                                                                                  | 0.253                | 0.658436           | 4.55                  |
| 0.70                                                                                                  | 0.524                | 0.877159           | 7.54                  |
| 0.75                                                                                                  | 0.675                | 0.99903            | 9.98                  |
| 0.80                                                                                                  | 0.842                | 1.133816           | 13.61                 |
| 0.90                                                                                                  | 1.282                | 1.488938           | 30.83                 |
| 0.95                                                                                                  | 1.645                | 1.781914           | 60.52                 |
| Z <sub>p</sub> = (Log10 LC50 - fish mean GMAV)/(fish std GMAV)                                        |                      |                    |                       |

**Table L.9. Summary of acute oral toxicity of diazinon to birds.**

| Common Name             | Species Name               | Mean LD50 (mg a.i./kg) | Log 10 LD50 | Test Substance (% a.i.) | MRID/ Accession       | Comments                                      |
|-------------------------|----------------------------|------------------------|-------------|-------------------------|-----------------------|-----------------------------------------------|
| Red-winged blackbird    | <i>Agelaius phoeniceus</i> | 3.2                    | 0.505       | >90.0                   | 20560                 | cited in RED                                  |
| Mallard Duck            | <i>Anas platyrhynchos</i>  | 6.38                   | 0.805       | 97.0                    | FEODIA06              | cited in RED                                  |
| Mallard Duck            | <i>Anas platyrhynchos</i>  | 6.66                   | 0.823       | 86.6                    | FEODIA04              | cited in RED                                  |
| Mallard Duck            | <i>Anas platyrhynchos</i>  | 3.54                   | 0.549       | 89.0                    | 160000                | cited in RED                                  |
| Mallard Duck            | <i>Anas platyrhynchos</i>  | 1.44                   | 0.158       | 88.2                    | 40895301              | cited in RED                                  |
| Mallard Duck            | <i>Anas platyrhynchos</i>  | 14                     | 1.146       | 86.6                    | Grimes and Jaber 1987 | cited in RED                                  |
| Mallard Duck            | <i>Anas platyrhynchos</i>  | 8.7                    | 0.940       | 89.2                    | FEODIA02              | cited in RED                                  |
| Mallard Duck            | <i>Anas platyrhynchos</i>  | 3.16                   | 0.500       | 86.6                    | FEODIA03              | cited in RED. Value is actually <3.16.        |
| Mallard Duck            | <i>Anas platyrhynchos</i>  | 3.16                   | 0.500       | 97.0                    | FEODIA05              | cited in RED. Value is actually <3.16.        |
| Mallard Duck            | <i>Anas platyrhynchos</i>  | 6                      | 0.778       | 86.6                    | FEODIA01              | cited in RED. Value is actually >6 and <24.6. |
| Canada goose            | <i>Branta canadensis</i>   | 6                      | 0.778       | 86.6                    | FEODIA07              | cited in RED. Value is actually >6.0 <39.3    |
| Canada goose            | <i>Branta canadensis</i>   | 6.16                   | 0.790       | 86.6                    | FEODIA08              | cited in RED                                  |
| Northern bobwhite quail | <i>Colinus virginianus</i> | 10                     | 1.000       | 99.0                    | ROODI002              | cited in RED                                  |
| Northern bobwhite quail | <i>Colinus virginianus</i> | 5.2                    | 0.716       | 89.0                    | 19015                 | cited in RED                                  |
| brown headed cowbird    | <i>Molothrus ater</i>      | 69                     | 1.839       | 88.2                    | 40895303              | cited in RED                                  |
| House sparrow           | <i>Passer domesticus</i>   | 7.5                    | 0.875       | >90                     | 20560                 | cited in RED                                  |
| Ring-necked pheasant    | <i>Phasianus colchicus</i> | 4.33                   | 0.636       | 89.0                    | 160000                | cited in RED                                  |

| Table L.10. Species Mean Acute Values (SMAVs) |                            |            |
|-----------------------------------------------|----------------------------|------------|
| Common Name                                   | Species Name               | Log10 SMAV |
| Red-winged blackbird                          | <i>Agelaius phoeniceus</i> | 0.5051     |
| Mallard Duck                                  | <i>Anas platyrhynchos</i>  | 0.6888     |
| Canada goose                                  | <i>Branta canadensis</i>   | 0.7839     |
| Northern bobwhite quail                       | <i>Colinus virginianus</i> | 0.8580     |
| brown headed cowbird                          | <i>Molothrus ater</i>      | 1.8388     |
| House sparrow                                 | <i>Passer domesticus</i>   | 0.8751     |
| Ring-necked pheasant                          | <i>Phasianus colchicus</i> | 0.636      |

| Table L.11. Genus Mean Acute Values (GMAVs) |                  |               |           |                  |               |
|---------------------------------------------|------------------|---------------|-----------|------------------|---------------|
| Common Name                                 | Species Name     | Log10 GMAV    | GMAV LC50 | Sensitivity Rank | Rank on curve |
| Red-winged blackbird                        | <i>Agelaius</i>  | 0.5051        | 3         | 1                | 0.00          |
| Mallard Duck                                | <i>Anas</i>      | 0.6888        | 5         | 3                | 0.33          |
| Canada goose                                | <i>Branta</i>    | 0.7839        | 6         | 4                | 0.50          |
| Northern bobwhite quail                     | <i>Colinus</i>   | 0.8580        | 7         | 5                | 0.67          |
| brown headed cowbird                        | <i>Molothrus</i> | 1.8388        | 69        | 7                | 1.00          |
| House sparrow                               | <i>Passer</i>    | 0.8751        | 8         | 6                | 0.83          |
| Ring-necked pheasant                        | <i>Phasianus</i> | 0.6365        | 4         | 2                | 0.17          |
| Genus Mean for All:                         |                  | <b>0.8837</b> | <b>15</b> |                  |               |
| Genus Standard Deviation for all:           |                  | <b>0.4407</b> | <b>24</b> |                  |               |

| Table L.12. Calculation of species sensitivity distribution curve          |                |             |                |
|----------------------------------------------------------------------------|----------------|-------------|----------------|
| Proportion                                                                 | Z <sub>p</sub> | Log10 point | Point Estimate |
| 0.05                                                                       | -1.645         | 0.158748    | 1              |
| 0.10                                                                       | -1.282         | 0.318731    | 2              |
| 0.20                                                                       | -0.842         | 0.512649    | 3              |
| 0.25                                                                       | -0.675         | 0.586464    | 4              |
| 0.30                                                                       | -0.524         | 0.6528      | 4              |
| 0.40                                                                       | -0.253         | 0.772236    | 6              |
| 0.50                                                                       | 0              | 0.883739    | 8              |
| 0.60                                                                       | 0.253          | 0.995243    | 10             |
| 0.70                                                                       | 0.524          | 1.114679    | 13             |
| 0.75                                                                       | 0.675          | 1.181228    | 15             |
| 0.80                                                                       | 0.842          | 1.254829    | 18             |
| 0.90                                                                       | 1.282          | 1.448748    | 28             |
| 0.95                                                                       | 1.645          | 1.608731    | 41             |
| $Z_p = (\text{Log10 LC50} - \text{fish mean GMAV})/(\text{fish std GMAV})$ |                |             |                |