

DEPARTMENT OF ECOLOGY

November 28, 1994

TO: Glen Patrick, Program Manager
Aquatic Toxicology
Washington State Department of Health

THROUGH: Larry Goldstein, ^{LG} Section Manager
Toxics Investigations Section
Washington State Department of Ecology

FROM: Art Johnson ^{aj}
Toxics Investigations Section
Washington State Department of Ecology

SUBJECT: PCB and Lead Results for 1994 Spokane River Fish Samples

The Department of Ecology has completed the analysis of PCBs in 42 composite edible tissue samples from fish and crayfish, and 7 composite whole fish samples collected in the Spokane River during August 2-8, 1994. Twenty-two of the edible tissue samples were also analyzed for lead. These data were obtained to assist your agency in determining if there is a significant human health risk from eating Spokane River fish. A Department of Ecology survey conducted in 1993 identified these contaminants as water quality concerns (Johnson et al., 1994).

Results

The results of chemical analysis are summarized in Table 1, edible tissue, and Table 2, whole fish. The 1993 data are included as Appendix B, chemical data, and Appendix C, lengths and weights. The complete 1994 chemical data and quality assurance reviews are attached.

PCB and lead concentrations in the 1994 samples are generally much lower than in 1993. Other than the number of fish per composite being larger in 1994, nothing in the way or time the samples were obtained, size of fish, tissue preparation, extraction, or analysis is a likely explanation for the differences between the two data sets. All the 1994 rainbow trout appeared to be wild fish (i.e., no adipose clip).

Methods

A total of 281 individual fish and 51 individual crayfish were obtained for analysis. Figure 1 shows where they were collected. Methods of collection, sample packaging, and preservation were identical to the 1993 survey. The sampling was done by Dale Davis, Dave Serdar, Bill Yake, and Dave Batts of Ecology's Toxics Investigations Section.

The tissue samples were prepared and analyzed as in 1993. The edible fish tissue samples were skin-on fillets with scales removed. Most of the edible tissue composites were from between 5 to 8 individual fish. Abdominal (tail) muscle was composited from 8 individuals for each crayfish sample, except for Long Lake where only 3 individuals were obtained. The whole fish samples were from either 5 or 8 largescale suckers and one sample of 2 yellow bullheads. Length and weight data and scientific names of the specimens used in the composite are in Appendix A.

Chemical analysis was done at the Ecology Manchester Environmental Laboratory. The PCB analysis, using EPA Method 8080, was done by Robert Reick (EPA) and Norman Olson; results were reviewed by Dickey Huntamer. Myrna McIntosh did the lead analysis and quality assurance review.

We would like to discuss the significance of these data at your earliest convenience. Please give me a call at 407-6766. Thank you.

References

Huntamer, D.D. 1994. Corrections to Analytical Results for the Spokane River PCB Fish and Sediment Study. Memorandum to L. Singleton and A. Johnson. Washington State Department of Ecology, Manchester Environmental Laboratory.

Johnson, A., D. Serdar, and D. Davis. 1994. Results of 1993 Screening Survey on PCBs and Metals in the Spokane River. Washington State Department of Ecology, Olympia.

AJ:jl

Attachments

cc (less data package): Carl Nuechterlein, Pat Hallinan, Bill Yake, Dale Davis, Dave Serdar, Steve Golding, David Batts, Jim Cabbage

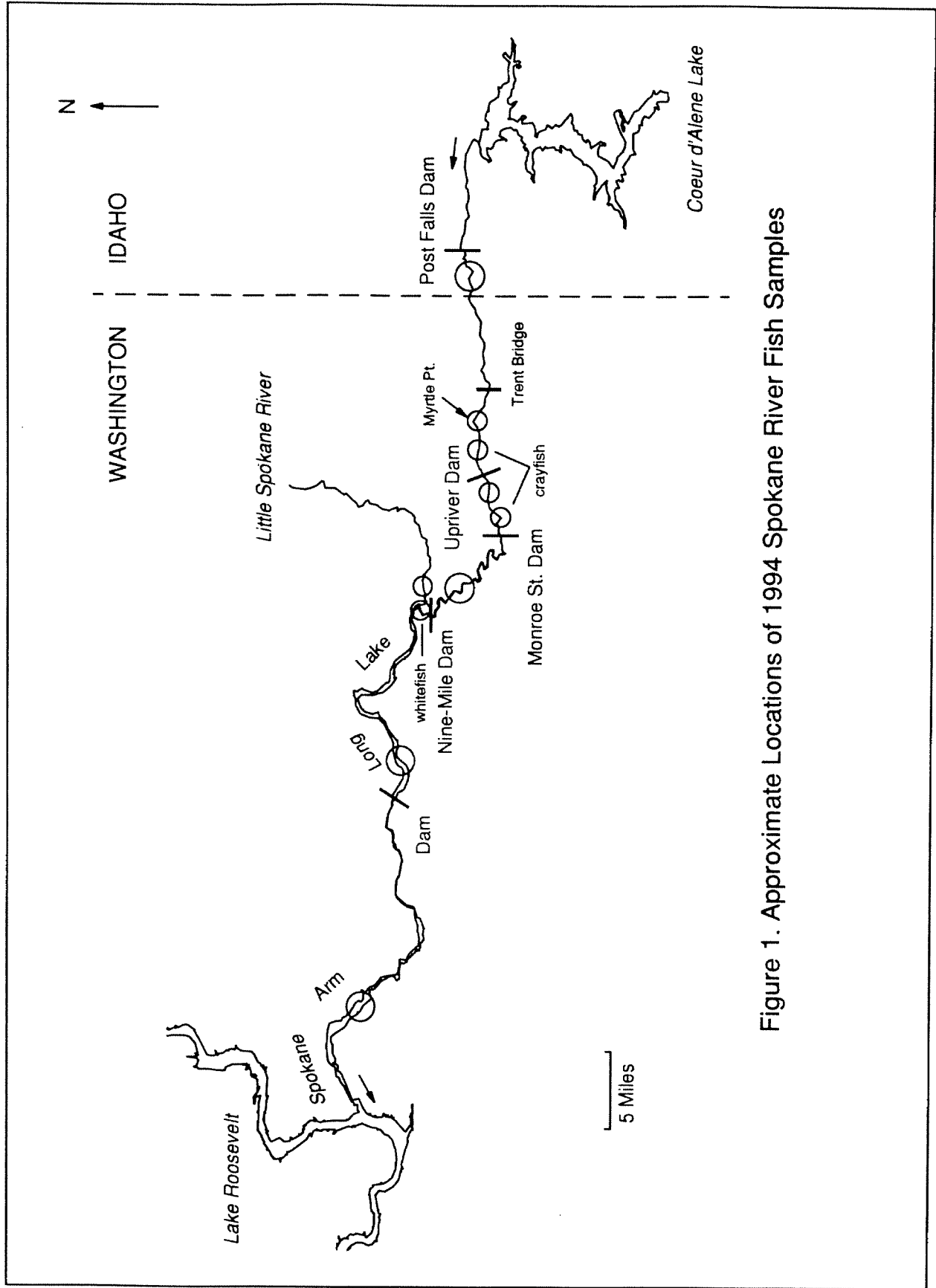


Figure 1. Approximate Locations of 1994 Spokane River Fish Samples

Table 1. PCBs and Lead in Edible Tissues of Spokane River Fish Collected August 2-8, 1994
(PCBs in ug/Kg (ppb); lead in mg/Kg (ppm); wet weight basis)

| Species | N = | Sample Number | Percent Lipid | PCB-1248 | PCB-1254 | PCB-1260 | Total PCBs | Lead |
|---------------------------------------|-----|---------------|---------------|----------|----------|----------|------------|--------|
| <u>Spokane Arm</u> | | | | | | | | |
| Walleye | 8 | 318230 | 0.9 | 7 U | 20 | 11 | 31 | na |
| " | 8 | 318231 | 0.8 | 15 J | 30 J | 13 | 58 J | na |
| " | 8 | 318232 | 0.9 | 14 J | 25 J | 11 | 50 J | na |
| <u>Long Lake</u> | | | | | | | | |
| Crayfish | 3 | 318253 | na | 9 U | 9 U | 9 U | nd | na |
| Largemouth Bass | 5 | 318240 | 1.0 | 20 J | 38 J | 36 | 94 J | na |
| " | 5 | 318247 | 1.1 | 27 J | 53 J | 24 | 104 J | na |
| White Crappie (duplicate analysis) | 7 | 318243 | 2.5 | 22 J | 46 J | 29 | 97 J | na |
| | | 328436 | 2.5 | 24 J | 42 J | 32 J | 98 J | na |
| Yellow Perch | 8 | 318244 | 0.2 | 6 U | 9 J | 6 U | 9 J | na |
| " | 8 | 318245 | 0.2 | 6 U | 10 J | 6 J | 16 J | na |
| " | 8 | 318246 | 0.2 | 6 U | 6 J | 6 U | 6 J | na |
| Brown Trout | 3 | 318241 | 4.0 | 40 J | 90 J | 63 | 193 J | 0.41 P |
| Mountain Whitefish | 8 | 318249 | 3.6 | 38 J | 52 J | 60 | 150 J | na |
| " | 7 | 318250 | 3.4 | 23 J | 38 J | 57 | 118 J | na |
| " | 7 | 318251 | 1.9 | 18 J | 19 J | 34 | 71 J | na |
| Northern Squawfish | 8 | 318233 | 1.5 | 40 J | 150 J | 110 | 300 J | na |
| " | 8 | 318234 | 1.6 | 30 J | 100 J | 76 | 206 J | na |
| " | 8 | 318235 | 1.2 | 30 J | 100 J | 70 | 200 J | |
| <u>Little Spokane River</u> | | | | | | | | |
| Cutthroat Trout | 1 | 318242 | 3.5 | 23 J | 55 J | 110 | 188 J | na |
| Mountain Whitefish | 8 | 318237 | 2.5 | 20 J | 35 J | 90 | 145 J | na |
| " | 8 | 318238 | 2.2 | 20 J | 45 J | 170 | 235 J | na |
| " | 8 | 318239 | 3.2 | 25 J | 50 J | 210 | 285 J | na |

U = not detected at or above reported value (i.e., less than)

J = estimated value

P = above detection limit but below minimum quantitation limit

na = not analyzed

nd = not detected

Table 1. (continued)

| Species | N = | Sample Number | Percent Lipid | PCB-1248 | PCB-1254 | PCB-1260 | Total PCBs | Lead |
|--------------------------------------|-----|---------------|---------------|----------|----------|----------|------------|--------|
| <u>Nine-Mile Reservoir</u> | | | | | | | | |
| Mountain Whitefish | 8 | 318257 | 6.9 | 56 J | 30 J | 34 | 120 | 0.10 U |
| " " | 8 | 318258 | 8.4 | 43 J | 35 J | 33 | 111 | 0.10 U |
| " " | 8 | 318259 | 6.6 | 91 J | 20 J | 74 | 185 | 0.10 U |
| Rainbow Trout | 6 | 318254 | 5.4 | 52 J | 98 J | 170 | 320 | 0.10 U |
| " " | 6 | 318255 | 3.0 | 44 J | 76 J | 85 | 205 | 0.10 U |
| " " | 6 | 318256 | 5.2 | 59 J | 410 J | 120 | 589 | 0.10 U |
| <u>Monroe St. Dam to Upriver Dam</u> | | | | | | | | |
| Crayfish | 8 | 328432 | 0.2 | 7 U | 7 U | 7 U | nd | 0.29 P |
| " " | 8 | 328433 | 0.3 | 7 U | 7 U | 7 U | nd | 0.28 P |
| " " | 8 | 328434 | 0.2 | 7 U | 7 U | 7 U | nd | 0.33 P |
| Mountain Whitefish | 8 | 328428 | 5.6 | 139 J | 261 J | 130 | 530 | 0.10 U |
| " " | 8 | 328429 | 5.5 | 99 J | 311 J | 39 | 449 | 0.10 U |
| " " | 8 | 328430 | 4.6 | 174 J | 462 J | 89 | 725 | 0.10 U |
| Rainbow Trout | 8 | 238425 | 1.2 | 29 J | 67 J | 68 | 164 | 0.14 P |
| " " | 7 | 328426 | 1.1 | 27 J | 44 J | 40 | 111 | 0.10 U |
| " " | 7 | 328427 | 1.2 | 39 J | 71 J | 51 | 161 | 0.10 U |
| <u>Upriver Dam to Trent St.</u> | | | | | | | | |
| Rainbow Trout | 8 | 318260 | 2.9 | 133 J | 197 J | 63 | 393 | 0.18 P |
| (duplicate analysis) | | 318260 | na | 127 J | 193 J | 57 | 377 | 0.16 P |
| Rainbow Trout | 8 | 318261 | 2.5 | 240 J | 390 J | 110 | 740 | 0.13 P |
| (duplicate analysis) | | 328437 | 2.8 | 172 | 218 | 81 | 471 | na |
| Rainbow Trout | 8 | 31262 | 3.7 | 130 J | 110 J | 40 | 280 | 0.11 P |
| <u>Upriver Dam to Myrtle Pt.</u> | | | | | | | | |
| Crayfish | 8 | 318264 | 0.1 | 8 U | 8 U | 8 U | nd | 0.46 P |
| " " | 8 | 318265 | 0.2 | 7 U | 7 U | 7 U | nd | 0.62 P |
| " " | 8 | 318266 | 0.1 | 6 U | 6 U | 7 | 7 | 0.91 P |

U = not detected at or above reported value (i.e., less than)

J = estimated value

P = above detection limit but below minimum quantitation limit

na = not analyzed

nd = not detected

Table 2. PCBs in Spokane River Whole Fish Samples Collected August 2-8, 1994
(PCBs in ug/Kg (ppb) wet weight basis)

| Species | N = | Sample Number | Percent Lipid | PCB-1248 | PCB-1254 | PCB-1260 | Total PCBs | Lead |
|--------------------------------------|-----|---------------|---------------|----------|----------|----------|------------|------|
| <u>Long Lake</u> | | | | | | | | |
| Largescale Sucker | 8 | 318248 | 3.4 | 140 J | 410 J | 270 | 820 J | na |
| Yellow Bullhead | 2 | 318252 | 1.9 | 14 U | 20 J | 26 | 46 J | na |
| <u>Little Spokane River</u> | | | | | | | | |
| Largescale Sucker | 5 | 318236 | 4.3 | 40 J | 140 J | 260 | 440 J | na |
| <u>Monroe St. Dam to Upriver Dam</u> | | | | | | | | |
| Largescale Sucker | 5 | 328431 | 1.2 | 34 J | 96 J | 71 | 201 J | na |
| <u>Upriver Dam to Trent Street</u> | | | | | | | | |
| Largescale Sucker | 5 | 318263 | 3.6 | 230 J | 230 J | 71 | 531 J | na |
| <u>Corbin Park, Idaho</u> | | | | | | | | |
| Largescale Sucker | 5 | 328435 | 5.5 | 39 U | 81 | 71 | 152 | na |

U = not detected at or above reported value (i.e., less than)

J = estimated value

na = not analyzed

Appendix A. Length and Weight of Spokane River Fish Collected for PCB and Lead Analysis

| Sample Number | Species | Total Length (mm) | Weight (gm) |
|---------------|------------------------------------|-------------------|-------------|
| | <u>Spokane Arm, August 2, 1994</u> | | |
| 318230 | Walleye | 370 | 467 |
| | | 269 | 175 |
| | | 243 | 112 |
| | | 245 | 98 |
| | | 260 | 163 |
| | | 225 | 73 |
| | | 257 | 135 |
| | | 236 | 95 |
| 318231 | Walleye | 362 | 364 |
| | | 255 | 147 |
| | | 242 | 94 |
| | | 213 | 79 |
| | | 250 | 145 |
| | | 243 | 135 |
| | | 238 | 106 |
| | | 255 | 114 |
| 318232 | Walleye | 374 | 430 |
| | | 309 | 214 |
| | | 255 | 116 |
| | | 243 | 107 |
| | | 231 | 119 |
| | | 255 | 126 |
| | | 487 | 365 |
| | | 239 | 98 |
| | <u>Long Lake, August 2, 1994</u> | | |
| 318233 | Northern Squawfish | 370 | 500 |
| | | 368 | 415 |
| | | 465 | 935 |
| | | 357 | 400 |
| | | 407 | 580 |
| | | 350 | 362 |
| | | 341 | 330 |
| | | 399 | 515 |
| 318234 | Northern Squawfish | 383 | 455 |
| | | 375 | 445 |
| | | 375 | 440 |
| | | 383 | 435 |
| | | 352 | 370 |
| | | 445 | 720 |
| | | 388 | 485 |
| | | 368 | 450 |

Appendix A. (continued)

| <u>Long Lake, August 2, 1994</u> | | | |
|----------------------------------|--------------------|-----|------|
| 318235 | Northern Squawfish | 378 | 415 |
| | | 354 | 365 |
| | | 418 | 585 |
| | | 369 | 455 |
| | | 417 | 595 |
| | | 396 | 538 |
| | | 355 | 330 |
| | | 415 | 590 |
| 318240 | Largemouth Bass | 335 | 695 |
| | | 340 | 665 |
| | | 368 | 825 |
| | | 313 | 485 |
| | | 450 | 1535 |
| 318247 | Largemouth Bass | 320 | 567 |
| | | 405 | 1097 |
| | | 395 | 1096 |
| | | 400 | 1119 |
| | | 340 | 649 |
| 318241 | Brown Trout | 390 | 580 |
| | | 262 | 181 |
| | | 275 | 219 |
| 318243 (328436 duplicate) | White Crappie | 294 | 513 |
| | | 269 | 385 |
| | | 210 | 163 |
| | | 210 | 196 |
| | | 202 | 164 |
| | | 198 | 135 |
| | | 275 | 421 |
| 318244 | Yellow Perch | 217 | 144 |
| | | 250 | 210 |
| | | 215 | 144 |
| | | 256 | 209 |
| | | 206 | 131 |
| | | 245 | 202 |
| | | 225 | 173 |
| | | 282 | 311 |

Appendix A. (continued)

| | | <u>Long Lake, August 2, 1994</u> | |
|--------|--------------------|----------------------------------|--------------------|
| 318245 | Yellow Perch | 248 | 210 |
| | | 255 | 259 |
| | | 217 | 153 |
| | | 246 | 190 |
| | | 245 | 221 |
| | | 280 | 298 |
| | | 250 | 246 |
| | | 217 | 166 |
| 318246 | Yellow Perch | 225 | 153 |
| | | 210 | 131 |
| | | 215 | 147 |
| | | 225 | 164 |
| | | 245 | 237 |
| | | 248 | 220 |
| | | 217 | 166 |
| | | 198 | 118 |
| 318249 | Mountain Whitefish | 325 | 374 |
| | | 296 | 222 |
| | | 232 | 107 |
| | | 244 | 125 |
| | | 227 | 89 |
| | | 225 | 98 |
| | | 233 | 102 |
| | | 234 | 100 |
| 318250 | Mountain Whitefish | 334 | 337 |
| | | 250 | 134 |
| | | 205 | 69 |
| | | 236 | 101 |
| | | 238 | 112 |
| | | 225 | 91 |
| | | 240 | 121 |
| | | 318251 | Mountain Whitefish |
| 245 | 116 | | |
| 206 | 79 | | |
| 235 | 110 | | |
| 225 | 91 | | |
| 232 | 83 | | |
| 245 | 125 | | |

Appendix A. (continued)

| | | |
|--------|---|------|
| | <u>Long Lake, August 2, 1994</u> | |
| 318253 | Crayfish | 66 |
| | | 48 |
| | | 74 |
| 318248 | Largescale Sucker | 484 |
| | | 513 |
| | | 475 |
| | | 482 |
| | | 417 |
| | | 450 |
| | | 454 |
| | | 470 |
| | | 1171 |
| | | 1443 |
| | | 1190 |
| | | 908 |
| | | 740 |
| | | 883 |
| | | 704 |
| | | 1004 |
| 318252 | Yellow Bullhead | 285 |
| | | 195 |
| | | 344 |
| | | 89 |
| | <u>Little Spokane River, August 3, 1994</u> | |
| 318237 | Mountain Whitefish | 324 |
| | | 310 |
| | | 326 |
| | | 305 |
| | | 290 |
| | | 342 |
| | | 313 |
| | | 334 |
| | | 280 |
| | | 270 |
| | | 300 |
| | | 280 |
| | | 205 |
| | | 345 |
| | | 285 |
| | | 350 |
| 318238 | Mountain Whitefish | 283 |
| | | 277 |
| | | 294 |
| | | 230 |
| | | 327 |
| | | 280 |
| | | 241 |
| | | 239 |
| | | 220 |
| | | 215 |
| | | 215 |
| | | 93 |
| | | 292 |
| | | 200 |
| | | 112 |
| | | 116 |
| 318239 | Mountain Whitefish | 325 |
| | | 277 |
| | | 217 |
| | | 224 |
| | | 287 |
| | | 294 |
| | | 305 |
| | | 305 |
| | | 295 |
| | | 208 |
| | | 90 |
| | | 98 |
| | | 215 |
| | | 231 |
| | | 264 |
| | | 256 |
| 318242 | Cutthroat Trout | 345 |
| | | 420 |

Appendix A. (continued)

| | | | |
|--------|---|-----|------|
| | <u>Little Spokane River, August 3, 1994</u> | | |
| 318236 | Largescale Sucker | 430 | 825 |
| | | 450 | 855 |
| | | 485 | 1145 |
| | | 460 | 1070 |
| | | 438 | 780 |
| | <u>Nine-Mile Reservoir, August 5, 1994</u> | | |
| 318254 | Rainbow Trout | 370 | 608 |
| | | 390 | 657 |
| | | 420 | 852 |
| | | 397 | 740 |
| | | 393 | 639 |
| | | 470 | 1230 |
| 318255 | Rainbow Trout | 355 | 580 |
| | | 425 | 877 |
| | | 380 | 661 |
| | | 400 | 625 |
| | | 376 | 563 |
| | | 440 | 947 |
| 318256 | Rainbow Trout | 395 | 613 |
| | | 351 | 468 |
| | | 435 | 1007 |
| | | 442 | 1129 |
| | | 427 | 770 |
| | | 474 | 1301 |
| 318257 | Mountain Whitefish | 245 | 149 |
| | | 238 | 124 |
| | | 235 | 118 |
| | | 236 | 119 |
| | | 235 | 118 |
| | | 238 | 120 |
| | | 220 | 95 |
| | | 225 | 96 |
| 318258 | Mountain Whitefish | 234 | 117 |
| | | 224 | 102 |
| | | 230 | 110 |
| | | 255 | 164 |
| | | 232 | 109 |
| | | 298 | 274 |
| | | 235 | 121 |
| | | 237 | 142 |

Appendix A. (continued)

| | | | |
|--------|--|-----|-----|
| | <u>Nine-Mile Reservoir, August 5, 1994</u> | | |
| 318259 | Mountain Whitefish | 348 | 416 |
| | | 235 | 128 |
| | | 236 | 124 |
| | | 305 | 300 |
| | | 228 | 105 |
| | | 246 | 148 |
| | | 236 | 116 |
| | | 236 | 118 |
| | <u>Monroe St. Dam to Upriver Dam, August 8, 1994</u> | | |
| 328425 | Rainbow Trout | 280 | 207 |
| | | 309 | 293 |
| | | 224 | 120 |
| | | 352 | 419 |
| | | 296 | 262 |
| | | 321 | 322 |
| | | 195 | 67 |
| | | 370 | 472 |
| 328426 | Rainbow Trout | 197 | 79 |
| | | 300 | 265 |
| | | 339 | 355 |
| | | 192 | 62 |
| | | 296 | 287 |
| | | 247 | 160 |
| | | 268 | 163 |
| 328427 | Rainbow Trout | 220 | 109 |
| | | 280 | 233 |
| | | 286 | 463 |
| | | 217 | 104 |
| | | 240 | 131 |
| | | 229 | 136 |
| | | 221 | 94 |
| 328428 | Mountain Whitefish | 326 | 340 |
| | | 306 | 292 |
| | | 305 | 259 |
| | | 218 | 105 |
| | | 295 | 222 |
| | | 319 | 323 |
| | | 302 | 263 |
| | | 242 | 144 |

Appendix A. (continued)

Monroe St. Dam to Upriver Dam, August 8, 1994

| | | | |
|---------|--------------------|-----|-----|
| 328249 | Mountain Whitefish | 322 | 293 |
| | | 311 | 275 |
| | | 230 | 125 |
| | | 285 | 206 |
| | | 307 | 269 |
| | | 318 | 246 |
| | | 307 | 324 |
| | | 319 | 316 |
| 328430 | Mountain Whitefish | 317 | 278 |
| | | 298 | 270 |
| | | 335 | 312 |
| | | 340 | 334 |
| | | 235 | 126 |
| | | 307 | 287 |
| | | 230 | 115 |
| | | 246 | 136 |
| 328432 | Crayfish | - | 43 |
| | | - | 63 |
| | | - | 54 |
| | | - | 82 |
| | | - | 56 |
| | | - | 55 |
| | | - | 45 |
| | | - | 83 |
| 3228433 | Crayfish | - | 60 |
| | | - | 47 |
| | | - | 69 |
| | | - | 54 |
| | | - | 56 |
| | | - | 75 |
| | | - | 40 |
| | | - | 43 |
| 328434 | Crayfish | - | 70 |
| | | - | 75 |
| | | - | 56 |
| | | - | 45 |
| | | - | 51 |
| | | - | 58 |
| | | - | 60 |
| | | - | 67 |

Appendix A. (continued)

| <u>Monroe St. Dam to Upriver Dam, August 8, 1994</u> | | | |
|--|-------------------|-----|------|
| 328431 | Largescale Sucker | 386 | 516 |
| | | 453 | 793 |
| | | 406 | 677 |
| | | 430 | 744 |
| | | 403 | 603 |
| <u>Upriver Dam to Trent St., August 6, 1994</u> | | | |
| 318260 (duplicate analysis) | Rainbow Trout | 454 | 915 |
| | | 319 | 358 |
| | | 331 | 395 |
| | | 275 | 197 |
| | | 428 | 701 |
| | | 389 | 262 |
| | | 284 | 279 |
| 353 | 445 | | |
| 318261 (328437 duplicate) | Rainbow Trout | 310 | 317 |
| | | 325 | 411 |
| | | 225 | 130 |
| | | 313 | 308 |
| | | 323 | 329 |
| | | 335 | 388 |
| | | 318 | 298 |
| | | 400 | 679 |
| 318262 | Rainbow Trout | 285 | 284 |
| | | 350 | 444 |
| | | 300 | 296 |
| | | 341 | 453 |
| | | 276 | 195 |
| | | 350 | 449 |
| | | 319 | 325 |
| | | 218 | 118 |
| 318263 | Largescale Sucker | 377 | 525 |
| | | 399 | 653 |
| | | 410 | 680 |
| | | 485 | 1188 |
| | | 415 | 680 |

Appendix A. (continued)

| <u>Upriver Dam to Myrtle Pt., August 6, 1994</u> | | | |
|--|-------------------|-----|------|
| 318264 | Crayfish | - | 108 |
| | | - | 39 |
| | | - | 46 |
| | | - | 91 |
| | | - | 74 |
| | | - | 96 |
| | | - | 48 |
| | | - | 35 |
| 318265 | Crayfish | - | 44 |
| | | - | 39 |
| | | - | 102 |
| | | - | 82 |
| | | - | 60 |
| | | - | 82 |
| | | - | 69 |
| | | - | 40 |
| 318266 | Crayfish | - | 72 |
| | | - | 40 |
| | | - | 43 |
| | | - | 62 |
| | | - | 45 |
| | | - | 54 |
| | | - | 57 |
| | | - | 69 |
| <u>Corbin Park, Idaho, August 10, 1994</u> | | | |
| 328435 | Largescale Sucker | 540 | 1875 |
| | | 474 | 1185 |
| | | 505 | 1265 |
| | | 442 | 1029 |
| | | 516 | 1362 |

Scientific Names:

| | | | |
|--------------------|----------------------------------|-----------------|-----------------------------|
| Brown Trout | <u>Salmo trutta</u> | Rainbow Trout | <u>Oncorhynchus mykiss</u> |
| Cutthroat Trout | <u>Oncorhynchus clarki</u> | Walleye | <u>Stizostedion vitreum</u> |
| Largemouth Bass | <u>Micropterus salmoides</u> | White Crappie | <u>Pomoxis annularis</u> |
| Largescale Sucker | <u>Catostomus macrocheilus</u> | Yellow Bullhead | <u>Ictalurus natalis</u> |
| Mountain Whitefish | <u>Prosopium williamsoni</u> | Yellow Perch | <u>Perca flavescens</u> |
| Northern Squawfish | <u>Ptychocheilus oregonensis</u> | | |

Appendix B. PCBs and Lead in Spokane River Fish Samples Collected July-August 1993

(PCBs in ug/Kg (ppb); lead in mg/Kg (ppm); wet weight basis)

(source: Huntamer 1994; Johnson et al., 1994)

| Species | N = | Tissue Type | Percent Lipid | PCB-1248 | PCB-1254 | PCB-1260 | Total PCBs | Lead |
|----------------------------------|-----|-------------|---------------|----------|----------|----------|------------|----------|
| <u>Spokane Arm</u> | | | | | | | | |
| Walleye | 5 | Edible | 0.4 | 8.8 U | 15 J | 8.8 U | 15 J | 0.050 UJ |
| Smallmouth Bass | 5 | " | 1.2 | 20 U | 28 J | 7.1 U | 28 J | 0.050 UJ |
| Kokanee | 2 | " | 4.4 | 50 U | 70 J | 22 | 92 J | 0.050 UJ |
| Largescale Sucker | 5 | Whole | 5.1 | 200 J | 250 J | 190 | 640 J | 0.64 J |
| <u>Long Lake</u> | | | | | | | | |
| Crayfish | 5 | Edible | 0.4 | 17 U | 17 U | 17 U | nd | 0.050 UJ |
| Yellow Perch | 5 | " | 0.2 | 10 U | 9.2 J | 7.1 U | 9.2 J | 0.050 UJ |
| (duplicate analysis) | 5 | " | | 10 U | 9.6 J | 6.8 U | 9.6 J | 0.050 UJ |
| Largemouth Bass | 5 | " | 0.6 | 45 U | 74 J | 23 | 97 J | 0.050 UJ |
| Mountain Whitefish | 5 | " | 3.5 | 200 J | 410 J | 170 | 780 J | 0.050 UJ |
| Largescale Sucker | 5 | Whole | 2.3 | 100 J | 180 J | 130 | 410 J | 0.74 |
| <u>Nine-Mile Reservoir</u> | | | | | | | | |
| Rainbow Trout (sm) | 4 | Edible | 2.7 | 200 J | 210 J | 64 | 474 J | 0.059 J |
| Rainbow Trout (lg) | 4 | " | 2.9 | 200 J | 240 J | 65 | 505 J | 0.054 J |
| Mountain Whitefish | 5 | " | 2.7 | 200 J | 280 J | 42 | 522 J | 0.050 UJ |
| Largescale Sucker | 5 | Whole | 5.6 | 400 J | 600 J | 210 | 1210 J | 2.0 J |
| <u>Upriver Dam to Myrtle Pt.</u> | | | | | | | | |
| Rainbow Trout (sm) | 5 | Edible | 1.7 | 400 J | 550 J | 78 U | 950 J | 0.49 J |
| Rainbow Trout (lg) | 5 | " | 1.9 | 400 J | 610 J | 74 | 1084 J | 0.75 J |
| Largescale Sucker | 5 | Whole | 4.3 | 800 J | 1800 J | 180 | 2780 J | 1.8 |
| (duplicate analysis) | | | | 800 J | 1800 J | 170 | 2770 J | 1.8 |
| <u>Above Post Falls Dam</u> | | | | | | | | |
| Largescale Sucker | 1 | Whole | 7.2 | 28 U | 55 | 41 | 96 J | 2.6 J |

U = not detected at or above reported value (i.e., less than)

J = estimated value

nd = not detected

Appendix C. Length and Weight of 1993 Spokane River Fish Samples

(from Johnson et al., 1994)

| Location | Species | Total | | Species | Total | | |
|------------------------------------|----------|--------------|----------------|------------|-------------|----------------|------|
| | | Length (mm) | Weight (grams) | | Length (mm) | Weight (grams) | |
| Spokane Arm (FDR Lake) | Walleye | 315 | 225 | Kokanee | 210 | 106 | |
| | | 328 | 275 | | 270 | 239 | |
| | | 322 | 275 | | | | |
| | | 308 | 229 | | | | |
| | | 315 | 272 | | | | |
| | | Smallmouth | 230 | 186 | Largescale | 490 | 1265 |
| | | Bass | 220 | 191 | Sucker | 510 | 1313 |
| | | | 226 | 196 | | 497 | 1291 |
| | | | 220 | 195 | | 368 | 978 |
| | | | 255 | 285 | | 504 | 1514 |
| samples collected July 25-27, 1993 | | | | | | | |
| Long Lake | Crayfish | 58* | 41 | Largemouth | 463 | 1702 | |
| | | 58 | 56 | | Bass | 457 | 1756 |
| | | 60 | 53 | | | 347 | 677 |
| | | 60 | 58 | | | 370 | 853 |
| | | 62 | 71 | | | 332 | 478 |
| | | Yellow Perch | 235 | 168 | | Largescale | 450 |
| | | | 198 | 99 | Sucker | 487 | 1133 |
| | | | 232 | 158 | | 432 | 760 |
| | | | 236 | 199 | | 490 | 1099 |
| | | | 242 | 186 | | 485 | 975 |
| | | Mountain | 315 | 227 | | | |
| | | Whitefish | 332 | 311 | | | |
| | | | 324 | 281 | | | |
| | | | 296 | 222 | | | |
| | | | 278 | 169 | | | |
| samples collected July 26-28, 1993 | | | | | | | |

* carapace length

Appendix C. (continued)

| Location | Species | Total Length (mm) | Weight (grams) | Species | Total Length (mm) | Weight (grams) | |
|-----------------------------------|---------------|-------------------|----------------|------------|-------------------|----------------|------|
| Above Nine Mile Dam | Rainbow Trout | 284 | 221 | Mountain | 249 | 131 | |
| | | 293 | 171 | Whitefish | 249 | 155 | |
| | | 232 | 135 | | 245 | 122 | |
| | | 238 | 129 | | 235 | 104 | |
| | | | | | 232 | 111 | |
| | | Rainbow Trout | 384 | 608 | Largescale | 553 | 1834 |
| | | | 295 | 237 | Sucker | 539 | 1691 |
| | | | 334 | 364 | | 542 | 1530 |
| | | | 356 | 432 | | 504 | 1354 |
| | | | | | | 447 | 889 |
| samples collected August 10, 1993 | | | | | | | |
| Above Upriver Dam | Rainbow Trout | 280 | 241 | Largescale | 505 | 1367 | |
| | | 285 | 255 | Sucker | 406 | 637 | |
| | | 240 | 161 | | 427 | 721 | |
| | | 331 | 393 | | 410 | 739 | |
| | | 305 | 286 | | 420 | 723 | |
| | | Rainbow Trout | 373 | 498 | | | |
| | | | 360 | 528 | | | |
| | | | 333 | 374 | | | |
| | | | 386 | 541 | | | |
| | | | 365 | 464 | | | |
| samples collected July 27, 1993 | | | | | | | |
| Above Post Falls (Idaho) | Largescale | 411 | 802 | | | | |
| | Sucker | | | | | | |
| sample collected August 9, 1993 | | | | | | | |