

APPENDIX G: Detailed Smolt Travel Time Tables

Table G-1. Travel time of PIT tagged yearling chinook smolts from Snake River trap to Lower Granite Dam, 1990.

| MULTI-DAY RELEASE | —MEDIAN RELEASE | DATES— RECAP | —TRAVEL TIME (DAYS)— | | | —FISH NUMBER— | | PERCENT DETECTED | LGR FLOW (KCFS) |
|----------------------|--------------------|-----------------|----------------------|--------------------------------|------|---------------|----------|---------------------|-----------------------|
| | | | MEDIAN | —95% CI LIMITS— LOWER UPPER | | RELEASE | DETECTED | | |
| | 04/09 | 04/18 | 9.1 | 7 | 11.1 | 77 | 37 | 48% | 50.2 |
| 4/10-4/11 | 04/10 | 04/18 | 8 | 7.2 | 9.2 | 100 | 34 | 34% | 50.8 |
| 4/16-4/18 | 04/18 | 04/23 | 5.3 | 5 | 5.8 | 147 | 59 | 40% | 65.2 |
| | 04/19 | 04/25 | 5.6 | 4.6 | 6.5 | 151 | 54 | 36% | 68.9 |
| | 04/20 | 04/26 | 5.6 | 5.2 | 6.4 | 149 | 59 | 40% | 69.4 |
| | 04/21 | 04/28 | 6.7 | 6.1 | 7.4 | 150 | 59 | 39% | 68.0 |
| | 04/22 | 04/28 | 6.4 | 5.8 | 7.7 | 148 | 66 | 45% | 68.5 |
| | 04/23 | 05/01 | 7.5 | 5.8 | 9.7 | 149 | 62 | 42% | 66.3 |
| | 04/24 | 05/02 | 8 | 7 | 9.6 | 150 | 70 | 47% | 64.5 |
| | 04/25 | 05/06 | 11.4 | 8.6 | 14.3 | 89 | 36 | 40% | 62.0 |
| | 04/26 | 05/05 | 8.8 | 6.5 | 11.7 | 95 | 44 | 46% | 61.2 |
| 4/27-4/28 | 04/27 | 05/05 | 8.4 | 5.7 | 10.3 | 76 | 28 | 37% | 61.0 |
| 4/29-4/30 | 04/29 | 05/07 | 7.8 | 6.8 | 8.9 | 68 | 38 | 56% | 62.0 |
| 5/1-5/5 | 05/01 | 05/09 | 8.1 | 7.1 | 9.4 | 83 | 34 | 41% | 65.3 |
| 5/7-5/8 | 05/08 | 05/13 | 5.1 | 4.2 | 5.5 | 72 | 31 | 43% | 85.4 |
| 5/9-5/13 | 05/10 | 05/14 | 4 | 3.3 | 4.5 | 82 | 48 | 52% | 84.5 |
| | 05/30 | 06/01 | 2.4 | 2.1 | 2.9 | 151 | 66 | 44% | 117.6 |
| 5/31-6/1 | 05/31 | 06/04 | 4.4 | 3.9 | 6.8 | 89 | 41 | 46% | 107.2 |
| 6/2-6/8 | 06/04 | 06/09 | 5.3 | 4.1 | 7.8 | 62 | 30 | 48% | 95.1 |

- Flow at Lower Granite Dam is the average flow (kcfs) over the period from the median date of release through the date preceding the median date of recovery.
- Distance from Snake River trap to Lower Granite Dam is 32 miles.
- Purse seine caught fish are excluded.

Table G-2. Travel time of PIT tagged hatchery steelhead smolts from Snake River trap to Lower Granite Dam, 1990.

| MULTI-DAY RELEASE | MEDIAN RELEASE | DATES— RECAP | —TRAVEL TIME (DAYS)— | | | —FISH NUMBER— | | PERCENT DETECTED | LGR FLOW (KCFS) |
|----------------------|-------------------|-----------------|----------------------|--------------------------|-------|---------------|----------|---------------------|-----------------------|
| | | | MEDIAN | —95% CI LIMITS— LOWER | UPPER | RELEASE | DETECTED | | |
| 4/16-4/18 | 04/18 | 04/23 | 5.0 | 4.4 | 5.5 | 90 | 75 | 83% | 65.2 |
| | 04/19 | 04/23 | 4.0 | 3.8 | 4.8 | 61 | 44 | 72% | 65.5 |
| | 04/20 | 04/24 | 3.9 | 3.7 | 4.9 | 64 | 50 | 78% | 68.0 |
| | 04/21 | 04/25 | 4.1 | 3.5 | 6.3 | 60 | 43 | 72% | 71.4 |
| | 04/22 | 04/27 | 4.9 | 3.1 | 7.4 | 53 | 39 | 74% | 70.1 |
| | 04/23 | 04/28 | 5.2 | 3.2 | 7.7 | 62 | 48 | 77% | 68.4 |
| | 04/24 | 04/30 | 5.7 | 4.8 | 6.8 | 60 | 43 | 72% | 65.8 |
| | 04/25 | 04/30 | 4.9 | 4.4 | 7.4 | 60 | 45 | 75% | 63.4 |
| | 04/26 | 05/02 | 5.8 | 4.7 | 7.1 | 60 | 47 | 78% | 61.9 |
| | 04/27 | 05/04 | 7.0 | 5.7 | 8.5 | 60 | 43 | 72% | 60.6 |
| | 04/28 | 05/04 | 5.8 | 4.7 | 6.5 | 64 | 50 | 78% | 60.6 |
| | 04/29 | 05/06 | 6.5 | 4.9 | 7.4 | 65 | 44 | 68% | 61.8 |
| | 04/30 | 05/06 | 5.9 | 4.7 | 6.7 | 60 | 40 | 67% | 60.8 |
| | 05/01 | 05/06 | 4.8 | 4.3 | 5.8 | 60 | 47 | 78% | 60.4 |
| | 05/02 | 05/08 | 6.0 | 4.7 | 7.8 | 60 | 42 | 70% | 62.9 |
| | 05/03 | 05/09 | 5.5 | 4.1 | 7.0 | 61 | 40 | 66% | 67.9 |
| | 05/04 | 05/10 | 5.5 | 4.7 | 9.2 | 60 | 44 | 73% | 72.0 |
| | 05/05 | 05/10 | 4.9 | 3.8 | 6.3 | 67 | 50 | 75% | 73.7 |
| | 05/06 | 05/10 | 4.0 | 3.4 | 6.1 | 60 | 48 | 80% | 76.1 |
| | 05/07 | 05/13 | 5.8 | 4.3 | 7.0 | 59 | 43 | 73% | 83.0 |
| | 05/08 | 05/12 | 4.3 | 3.0 | 6.5 | 60 | 46 | 77% | 85.5 |
| | 05/09 | 05/14 | 4.8 | 3.8 | 5.6 | 60 | 41 | 68% | 84.4 |
| | 05/10 | 05/14 | 4.1 | 3.8 | 6.4 | 60 | 42 | 70% | 84.5 |
| | 05/11 | 05/17 | 6.0 | 3.0 | 13.8 | 59 | 39 | 66% | 76.3 |
| | 05/12 | 05/18 | 6.0 | 3.0 | 8.9 | 60 | 42 | 70% | 70.1 |
| | 05/13 | 05/24 | 10.5 | 7.9 | 13.5 | 60 | 41 | 68% | 54.0 |
| | 05/14 | 05/26 | 11.9 | 6.8 | 12.4 | 60 | 43 | 72% | 53.9 |
| | 05/15 | 05/25 | 9.9 | 7.0 | 11.2 | 60 | 44 | 73% | 48.4 |
| | 05/16 | 05/24 | 8.3 | 4.9 | 10.4 | 60 | 46 | 77% | 43.9 |
| | 05/17 | 05/26 | 8.9 | 7.8 | 9.4 | 60 | 42 | 70% | 48.7 |
| | 05/18 | 05/26 | 8.4 | 8.2 | 8.5 | 60 | 46 | 77% | 49.0 |
| 05/19 | 05/26 | 7.2 | 7.0 | 7.4 | 60 | 49 | 82% | 49.4 | |
| 5/20-5/21 | 05/21 | 05/27 | 5.9 | 5.2 | 6.3 | 74 | 53 | 72% | 54.3 |
| | 05/22 | 05/26 | 4.1 | 4.0 | 4.7 | 65 | 47 | 72% | 54.4 |
| | 05/23 | 05/26 | 3.2 | 3.1 | 3.4 | 59 | 40 | 68% | 58.8 |
| | 05/24 | 05/27 | 3.1 | 2.7 | 3.6 | 60 | 38 | 63% | 66.6 |
| | 05/25 | 05/29 | 3.5 | 3.2 | 4.1 | 60 | 41 | 68% | 70.3 |
| | 05/26 | 05/29 | 3.1 | 2.9 | 3.9 | 60 | 35 | 58% | 67.6 |
| | 05/27 | 05/30 | 3.0 | 2.6 | 3.4 | 58 | 45 | 78% | 74.4 |
| | 05/28 | 05/31 | 2.7 | 2.5 | 2.9 | 60 | 47 | 78% | 90.6 |
| | 05/29 | 05/31 | 1.9 | 1.8 | 2.1 | 59 | 49 | 83% | 100.3 |
| | 05/30 | 06/01 | 1.7 | 1.5 | 2.0 | 62 | 47 | 76% | 117.6 |
| | 05/31 | 06/02 | 2.1 | 1.8 | 2.7 | 60 | 51 | 85% | 113.6 |
| 6/4-6/5 | 06/01 | 06/03 | 2.3 | 2.0 | 2.8 | 60 | 49 | 82% | 106.4 |
| | 06/02 | 06/04 | 2.1 | 2.0 | 2.7 | 60 | 45 | 75% | 100.7 |
| | 06/03 | 06/05 | 2.2 | 2.1 | 2.8 | 62 | 43 | 69% | 95.2 |
| | 06/05 | 06/08 | 3.0 | 2.6 | 3.5 | 84 | 57 | 68% | 95.4 |
| 6/6-6/9 | 06/07 | 06/10 | 3.0 | 2.8 | 3.6 | 45 | 34 | 76% | 91.9 |
| 6/10-6/11 | 06/11 | 06/14 | 2.7 | 2.1 | 3.0 | 68 | 42 | 62% | 91.8 |
| 6/12-6/13 | 06/12 | 06/15 | 3.1 | 2.6 | 3.8 | 75 | 48 | 64% | 91.4 |

- Flow at Lower Granite Dam is the average flow (kcfs) over the period from the median date of release through the date preceding the median date of recovery.
- Distance from Snake River trap to Lower Granite Dam is 32 miles.
- Purse seine caught fish are excluded.

Table G-3. Travel time of PIT tagged wild steelhead smolts from Snake River trap to Lower Granite Dam, 1990.

| MULTI-DAY RELEASE | MEDIAN RELEASE | DATES— RECAP | TRAVEL TIME (DAYS) | | | FISH NUMBER | | PERCENT DETECTED | LGR FLOW (KCFS) |
|----------------------|-------------------|-----------------|--------------------|-------------------------|-------|-------------|----------|---------------------|-----------------------|
| | | | MEDIAN | 95% CI LIMITS— LOWER | UPPER | RELEASE | DETECTED | | |
| 4/9-4/17 | 04/15 | 04/19 | 4.0 | 3.6 | 4.4 | 52 | 30 | 58% | 60.9 |
| | 04/18 | 04/22 | 3.6 | 3.3 | 4.2 | 52 | 36 | 69% | 64.2 |
| | 04/19 | 04/23 | 3.6 | 3.4 | 4.2 | 80 | 50 | 63% | 65.5 |
| | 04/20 | 04/23 | 3.1 | 2.9 | 3.3 | 62 | 37 | 60% | 66.1 |
| | 04/21 | 04/24 | 3.1 | 2.7 | 3.5 | 110 | 69 | 63% | 69.3 |
| | 04/22 | 04/25 | 2.8 | 2.5 | 3.1 | 97 | 72 | 74% | 73.5 |
| | 04/23 | 04/26 | 3.4 | 2.8 | 4.3 | 88 | 52 | 59% | 72.7 |
| | 04/24 | 04/28 | 3.6 | 3.4 | 3.8 | 172 | 111 | 65% | 67.1 |
| | 04/25 | 04/29 | 3.9 | 3.7 | 4.4 | 140 | 86 | 61% | 62.3 |
| | 04/26 | 04/30 | 4.0 | 3.8 | 4.2 | 143 | 95 | 66% | 62.6 |
| | 04/27 | 05/01 | 3.7 | 3.0 | 4.9 | 40 | 22 | 55% | 62.4 |
| | 04/28 | 05/02 | 4.4 | 4.1 | 4.5 | 109 | 66 | 61% | 62.0 |
| | 04/29 | 05/04 | 4.6 | 3.9 | 5.3 | 81 | 55 | 68% | 61.0 |
| | 04/30 | 05/05 | 4.5 | 4.2 | 5.2 | 75 | 50 | 67% | 60.2 |
| | 05/01 | 05/06 | 4.5 | 3.7 | 5.3 | 76 | 49 | 64% | 60.4 |
| | 05/02 | 05/06 | 3.7 | 3.4 | 4.3 | 42 | 27 | 64% | 60.8 |
| | 05/03 | 05/07 | 3.7 | 3.5 | 4.6 | 62 | 45 | 73% | 62.5 |
| | 05/04 | 05/08 | 3.9 | 3.3 | 4.5 | 40 | 27 | 68% | 65.5 |
| | 05/05 | 05/09 | 3.6 | 3.4 | 4.0 | 72 | 53 | 74% | 71.0 |
| | 05/06 | 05/09 | 3.1 | 2.8 | 3.7 | 114 | 80 | 70% | 73.5 |
| 05/07 | 05/11 | 3.5 | 3.4 | 3.6 | 225 | 147 | 65% | 82.4 | |
| 05/08 | 05/12 | 3.5 | 3.1 | 4.0 | 129 | 87 | 67% | 85.5 | |
| 05/09 | 05/12 | 3.2 | 2.8 | 3.6 | 96 | 55 | 57% | 85.3 | |
| 05/10 | 05/13 | 3.1 | 2.7 | 3.7 | 53 | 36 | 68% | 85.6 | |
| 5/11-5/12 | 05/12 | 05/16 | 3.7 | 2.8 | 5.0 | 63 | 39 | 62% | 81.9 |
| | 05/13 | 05/19 | 5.6 | 4.2 | 7.1 | 66 | 45 | 68% | 63.6 |
| | 05/14 | 05/20 | 5.8 | 4.8 | 6.6 | 82 | 50 | 61% | 57.8 |
| 5/15-5/16 | 05/16 | 05/21 | 5.1 | 4.7 | 6.0 | 70 | 44 | 63% | 45.1 |
| 5/17-5/18 | 05/17 | 05/22 | 4.8 | 4.4 | 6.1 | 56 | 41 | 73% | 44.1 |
| 5/19-5/20 | 05/19 | 05/25 | 6.2 | 5.6 | 7.1 | 34 | 24 | 71% | 44.6 |
| 5/21-5/23 | 05/22 | 05/26 | 3.6 | 3.2 | 4.0 | 55 | 32 | 58% | 54.4 |
| 5/24-5/25 | 05/25 | 05/28 | 3.4 | 3.1 | 4.1 | 63 | 40 | 63% | 70.0 |
| 5/26-5/27 | 05/26 | 05/30 | 3.6 | 3.0 | 3.9 | 80 | 39 | 49% | 72.4 |
| 5/28-5/29 | 05/28 | 05/31 | 2.5 | 2.2 | 2.6 | 80 | 57 | 71% | 90.6 |
| | 05/30 | 06/01 | 1.7 | 1.6 | 2.0 | 80 | 62 | 78% | 117.6 |
| 5/31-6/1 | 06/01 | 06/04 | 2.5 | 1.9 | 3.2 | 57 | 44 | 77% | 100.8 |
| 6/2-6/5 | 06/02 | 06/05 | 3.4 | 1.9 | 4.0 | 37 | 27 | 73% | 98.7 |
| 6/8-6/14 | 06/12 | 06/15 | 3.1 | 2.8 | 4.4 | 22 | 15 | 68% | 91.4 |

- Flow at Lower Granite Dam is the average flow (kcfs) over the period from the median date of release through the date preceding the median date of recovery.
- Distance from Snake River trap to Lower Granite Dam is 32 miles.
- Purse seine caught fish are excluded.

Table G-4. Travel time of PIT tagged yearling chinook smolts from Clearwater River trap to Lower Granite Dam, 1990.

| MU | LTI-DAY | —MEDIAN DATES— | | —TRAVEL TIME (DAYS)— | | | —FISH NUMBER— | | PERCENT DETECTED | LGR FLOW (KCFPS) |
|----|-----------|----------------|-------|----------------------|-------|-------|---------------|----------|------------------|------------------|
| | | RELEASE | RECAP | MEDIAN | LOWER | UPPER | RELEASE | DETECTED | | |
| | | 03/30 | 04/21 | 21.5 | 18.8 | 24.6 | 150 | 46 | 31% | 48.6 |
| | | 03/31 | 04/21 | 20.6 | 18.3 | 23.9 | 150 | 51 | 34% | 49.1 |
| | | 04/01 | 04/22 | 20.5 | 18.8 | 21.4 | 150 | 40 | 27% | 50.6 |
| | | 04/02 | 04/19 | 17.2 | 14.6 | 20.6 | 150 | 42 | 28% | 49.3 |
| | | 04/03 | 04/22 | 19.0 | 15.6 | 21.6 | 150 | 46 | 31% | 52.6 |
| | | 04/04 | 04/20 | 16.4 | 11.7 | 18.9 | 151 | 45 | 30% | 51.5 |
| | | 04/05 | 04/30 | 25.0 | 19.1 | 31.3 | 150 | 44 | 29% | 57.7 |
| | | 04/06 | 04/24 | 18.2 | 16.2 | 28.5 | 149 | 37 | 25% | 55.3 |
| | | 04/07 | 04/24 | 16.7 | 15.5 | 20.6 | 148 | 42 | 28% | 55.5 |
| | | 04/08 | 04/25 | 16.6 | 13.1 | 23.0 | 150 | 48 | 32% | 57.3 |
| | | 04/09 | 04/21 | 11.7 | 10.1 | 15.1 | 148 | 47 | 32% | 53.6 |
| | | 04/10 | 04/22 | 12.2 | 10.4 | 13.3 | 152 | 43 | 28% | 55.2 |
| | | 04/11 | 04/23 | 12.0 | 9.7 | 16.1 | 151 | 42 | 28% | 56.9 |
| | | 04/12 | 04/28 | 15.9 | 11.2 | 21.9 | 150 | 45 | 30% | 61.1 |
| | | 04/13 | 04/30 | 16.6 | 13.0 | 25.4 | 150 | 48 | 32% | 62.7 |
| | | 04/14 | 05/03 | 18.5 | 14.2 | 22.8 | 150 | 43 | 29% | 63.0 |
| | | 04/15 | 05/07 | 21.5 | 14.8 | 23.6 | 150 | 58 | 39% | 63.7 |
| | | 04/16 | 04/27 | 11.4 | 9.0 | 18.3 | 151 | 55 | 36% | 66.5 |
| | | 04/17 | 04/28 | 10.9 | 6.8 | 18.5 | 90 | 29 | 32% | 66.3 |
| | 4/18-4/19 | 04/18 | 04/28 | 10.0 | 7.4 | 17.5 | 111 | 36 | 32% | 66.8 |
| | 4/20-4/21 | 04/21 | 04/30 | 8.8 | 7.5 | 13.2 | 93 | 33 | 35% | 67.0 |
| | | 04/28 | 05/10 | 11.7 | 8.8 | 17.9 | 24 | 10 | 42% | 66.3 |
| | | 05/02 | 05/10 | 8.4 | 7.7 | 11.8 | 52 | 23 | 44% | 68.5 |
| | | 05/03 | 05/11 | 8.3 | 6.9 | 9.8 | 85 | 28 | 33% | 72.5 |
| | | 05/06 | 05/16 | 9.8 | 7.4 | 15.3 | 31 | 13 | 42% | 80.4 |
| | | 05/17 | 05/26 | 9.1 | 7.8 | 9.4 | 78 | 30 | 38% | 48.7 |
| | | 05/18 | 05/25 | 7.4 | 7.0 | 8.0 | 134 | 41 | 31% | 44.8 |
| | | 05/19 | 05/26 | 7.2 | 6.3 | 7.6 | 151 | 36 | 24% | 49.4 |
| | | 05/20 | 05/26 | 6.2 | 5.9 | 6.4 | 150 | 35 | 23% | 49.9 |
| | | 05/21 | 05/27 | 5.5 | 5.4 | 5.6 | 152 | 58 | 38% | 54.3 |
| | | 05/22 | 05/27 | 4.5 | 4.4 | 4.6 | 150 | 37 | 25% | 56.7 |
| | | 05/23 | 05/27 | 3.7 | 3.6 | 4.2 | 150 | 46 | 31% | 60.7 |
| | | 05/24 | 05/29 | 5.4 | 4.3 | 6.0 | 170 | 61 | 36% | 67.3 |
| | | 05/25 | 05/31 | 5.6 | 4.5 | 6.9 | 82 | 27 | 33% | 80.3 |

- Flow at Lower Granite Dam is the average flow (kcfs) over the period from the median date of release through the date preceding the median date of recovery.
- Distance from Clearwater River trap to Lower Granite Dam is 38 miles.

Table G-5. Travel time of PIT tagged hatchery steelhead smolts from Clearwater River trap to Lower Granite Dam, 1990.

| MULTI-DAY RELEASE | ---MEDIAN DATES--- | | ---TRAVEL TIME (DAYS)--- | | | ---FISH NUMBER--- | | PERCENT DETECTED | LGR FLOW (KCFS) |
|----------------------|--------------------|-------|--------------------------|---------------------|-------|-------------------|----------|---------------------|-----------------------|
| | RELEASE | RECAP | MEDIAN | ---95% CI LIMITS--- | UPPER | RELEASE | DETECTED | | |
| 4/20-4/21 | 04/18 | 04/24 | 5.7 | 4.5 | 7.9 | 29 | 19 | 66% | 66.6 |
| | 04/19 | 04/25 | 6.2 | 4.2 | 8.5 | 58 | 42 | 72% | 68.9 |
| | 04/20 | 04/25 | 4.6 | 3.9 | 5.6 | 67 | 47 | 70% | 69.9 |
| | 04/27 | 05/03 | 5.5 | 4.5 | 7.1 | 42 | 30 | 71% | 60.8 |
| | 04/28 | 05/06 | 7.5 | 6.8 | 8.9 | 83 | 62 | 75% | 61.4 |
| | 04/29 | 05/07 | 7.8 | 6.6 | 8.8 | 75 | 62 | 83% | 62.0 |
| | 05/02 | 05/09 | 6.9 | 4.9 | 8.3 | 40 | 28 | 70% | 66.2 |
| | 05/03 | 05/09 | 6.0 | 5.2 | 7.6 | 63 | 50 | 79% | 67.9 |
| | 05/04 | 05/09 | 5.4 | 4.8 | 8.1 | 59 | 47 | 80% | 69.6 |
| | 05/05 | 05/11 | 6.0 | 4.5 | 8.0 | 60 | 44 | 73% | 76.1 |
| | 05/06 | 05/10 | 3.7 | 3.2 | 4.3 | 60 | 47 | 78% | 76.1 |
| | 05/07 | 05/13 | 6.2 | 5.5 | 6.9 | 60 | 46 | 77% | 83.0 |
| | 05/17 | 05/25 | 7.9 | 7.6 | 9.1 | 61 | 44 | 72% | 44.9 |
| | 05/18 | 05/26 | 8.2 | 7.6 | 8.8 | 60 | 46 | 77% | 49.0 |
| | 05/19 | 05/26 | 7.1 | 6.9 | 7.6 | 60 | 27 | 45% | 49.4 |
| | 05/20 | 05/26 | 6.4 | 5.9 | 6.9 | 62 | 28 | 45% | 49.9 |
| | 05/21 | 05/27 | 6.1 | 5.3 | 6.6 | 63 | 41 | 65% | 54.3 |
| | 05/22 | 05/27 | 4.5 | 4.1 | 4.9 | 61 | 31 | 51% | 56.7 |
| | 05/23 | 05/27 | 3.9 | 3.6 | 4.2 | 61 | 54 | 89% | 60.7 |
| | 05/24 | 05/28 | 4.2 | 3.7 | 5.2 | 61 | 51 | 84% | 66.3 |
| 05/25 | 05/30 | 5.1 | 4.9 | 5.9 | 35 | 25 | 71% | 73.6 | |

- Flow at Lower Granite Dam is the average flow (kcfs) over the period from the median date of release through the date preceding the median date of recovery.
- Distance from Clearwater River trap to Lower Granite Dam is 38 miles.

Table G-6. Travel time of PIT tagged wild steelhead smolts from Clearwater River trap to Lower Granite Dam, 1990.

| MULTI-DAY RELEASE | —MEDIAN RELEASE | DATES— RECAP | —TRAVEL TIME (DAYS)— | | | —FISH NUMBER— | | PERCENT DETECTED | LGR FLOW (KCFS) |
|----------------------|--------------------|-----------------|----------------------|--------------------------|-------|---------------|----------|---------------------|-----------------------|
| | | | MEDIAN | —95% CI LIMITS— LOWER | UPPER | RELEASE | DETECTED | | |
| 4/4-4/8 | 04/05 | 04/12 | 7.2 | 5.8 | 8.1 | 38 | 22 | 58% | 48.4 |
| 4/9-4/11 | 04/10 | 04/17 | 7.0 | 5.7 | 7.5 | 63 | 30 | 48% | 49.2 |
| 4/12-4/14 | 04/13 | 04/19 | 6.2 | 5.2 | 8.7 | 49 | 20 | 41% | 55.9 |
| | 04/15 | 04/20 | 4.7 | 3.8 | 6.3 | 64 | 36 | 56% | 61.5 |
| 4/16-4/21 | 04/18 | 04/23 | 5.1 | 3.5 | 8.0 | 32 | 18 | 56% | 65.2 |
| 4/27-4/28 | 04/28 | 05/04 | 5.6 | 4.7 | 6.2 | 41 | 26 | 63% | 60.6 |
| | 04/29 | 05/05 | 5.6 | 4.8 | 6.9 | 74 | 48 | 65% | 61.5 |
| 4/30-5/2 | 05/01 | 05/06 | 4.7 | 4.3 | 6.0 | 30 | 22 | 73% | 60.4 |
| 5/3-5/4 | 05/03 | 05/07 | 4.3 | 4.0 | 4.7 | 43 | 23 | 53% | 62.5 |
| 5/5-5/7 | 05/07 | 05/11 | 3.6 | 3.3 | 5.0 | 52 | 30 | 58% | 82.4 |
| | 05/17 | 05/24 | 6.9 | 5.4 | 7.6 | 87 | 53 | 61% | 43.5 |
| | 05/18 | 05/25 | 7.4 | 6.5 | 8.3 | 80 | 37 | 46% | 44.8 |
| | 05/19 | 05/26 | 6.6 | 6.2 | 6.9 | 75 | 47 | 63% | 49.4 |
| | 05/20 | 05/26 | 5.8 | 5.5 | 6.4 | 95 | 42 | 44% | 49.9 |
| | 05/21 | 05/26 | 4.8 | 4.5 | 5.1 | 96 | 55 | 57% | 51.9 |
| | 05/22 | 05/26 | 4.3 | 4.1 | 4.5 | 87 | 42 | 48% | 54.4 |
| | 05/23 | 05/27 | 3.5 | 3.4 | 3.7 | 150 | 118 | 79% | 60.7 |
| 5/24-5/25 | 05/24 | 05/28 | 3.8 | 3.3 | 4.3 | 154 | 98 | 64% | 66.3 |

- Flow at Lower Granite Dam is the average flow (kcfs) over the period from the median date of release through the date preceding the median date of recovery.
- Distance from Clearwater River trap to Lower Granite Dam is 38 miles.

Table G-7. Travel time of PIT tagged yearling chinook and steelhead smolts from Lower Granite Dam to McNary Dam, 1990.

| MULTI-DAY RELEASE | MEDIAN RELEASE | —MEDIAN DATES— | | —TRAVEL TIME (DAYS)— | | | RELEASE NUMBER | —NUMBER DETECTED— | | IHR FLOW (KCFS) |
|--|-------------------|----------------|-------|----------------------|-------|-------|-------------------|-------------------|-----|-----------------------|
| | | LGR | MCN | MEDIAN | LOWER | UPPER | | LGR | MCN | |
| *** SNAKE RIVER TRAP YEARLING CHINOOK *** | | | | | | | | | | |
| 4/9-4/11 | 04/10 | 04/18 | 04/30 | 12.3 | 9.1 | 17.2 | 177 | 71 | 18 | 66.4 |
| 4/16-4/19 | 04/19 | 04/24 | 05/09 | 14.5 | 12.8 | 15.8 | 298 | 113 | 35 | 63.7 |
| 4/20-4/21 | 04/21 | 04/27 | 05/11 | 14.2 | 11.1 | 17.0 | 299 | 118 | 38 | 74.7 |
| 4/22-4/23 | 04/23 | 04/30 | 05/12 | 12.4 | 10.2 | 16.2 | 297 | 128 | 29 | 81.4 |
| 4/24-4/26 | 04/25 | 05/04 | 05/16 | 11.8 | 8.8 | 14.7 | 333 | 149 | 32 | 85.1 |
| *** CLEARWATER RIVER TRAP YEARLING CHINOOK *** | | | | | | | | | | |
| 3/30-4/1 | 03/31 | 04/21 | 05/10 | 19.3 | 12.3 | 24.6 | 450 | 137 | 24 | 67.1 |
| 4/2-4/3 | 04/02 | 04/20 | 05/08 | 17.5 | 12.6 | 22.8 | 300 | 88 | 30 | 62.9 |
| 4/4-4/6 | 04/05 | 04/24 | 05/10 | 16.3 | 8.1 | 23.4 | 450 | 126 | 24 | 67.1 |
| 4/7-4/8 | 04/08 | 04/24 | 05/10 | 15.5 | 10.0 | 19.8 | 446 | 137 | 35 | 67.1 |
| 4/10-4/12 | 04/11 | 04/24 | 05/10 | 16.4 | 12.7 | 22.9 | 453 | 130 | 33 | 67.1 |
| 4/13-4/15 | 04/14 | 05/03 | 05/14 | 11.4 | 3.2 | 16.5 | 450 | 149 | 38 | 85.5 |
| 4/16-4/20 | 04/17 | 04/28 | 05/11 | 13.3 | 7.4 | 17.7 | 397 | 133 | 24 | 74.7 |
| 5/17-5/20 | 05/19 | 05/26 | 06/04 | 8.7 | 6.8 | 10.1 | 513 | 142 | 24 | 105.1 |
| 5/21-5/22 | 05/21 | 05/26 | 06/03 | 8.0 | 6.5 | 9.2 | 302 | 95 | 19 | 105.1 |
| 5/23-5/25 | 05/24 | 05/29 | 06/05 | 6.7 | 4.8 | 8.6 | 402 | 134 | 29 | 105.3 |
| *** SNAKE RIVER TRAP WILD STEELHEAD *** | | | | | | | | | | |
| 4/19-4/23 | 04/21 | 04/24 | 05/04 | 10.4 | 8.1 | 12.3 | 436 | 280 | 23 | 62.3 |
| 4/24-4/29 | 04/26 | 04/30 | 05/11 | 10.5 | 9.7 | 12.7 | 685 | 435 | 26 | 74.7 |

- Lower bound is the minimum difference between the 95% confidence intervals of individual travel time distributions at Lower Granite and McNary dams, i.e., MCN lower limit - LGR upper limit.
- Upper bound is the maximum difference between the 95% confidence intervals of individual travel time distributions at Lower Granite and McNary dams, i.e., MCN upper limit - LGR lower limit.
- Flow at Ice Harbor Dam is the average flow (kcfs) over the seven day period around the estimated date of median passage at Ice Harbor Dam.
- Distance from Lower Granite Dam to McNary Dam is 140 miles.

Table G-8. Travel time of PIT tagged yearling chinook smolts from Rock Island Dam to McNary Dam, 1990.

| MULTI-DAY RELEASE | —MEDIAN DATES— | | —TRAVEL TIME (DAYS)— | | | —FISH NUMBER— | | PERCENT DETECTED | PRD FLOW (KCF/S) |
|----------------------|----------------|-------|----------------------|--------------------------|-------|---------------|----------|---------------------|------------------------|
| | RELEASE | RECAP | MEDIAN | —95% CI LIMITS— LOWER | UPPER | RELEASE | DETECTED | | |
| | 04/21 | 05/13 | 21.7 | 18.5 | 24.7 | 99 | 21 | 21% | 151.9 |
| | 04/22 | 05/08 | 15.6 | 12.5 | 20.9 | 93 | 27 | 29% | 155.6 |
| | 04/23 | 05/08 | 15.0 | 10.3 | 18.2 | 101 | 29 | 29% | 154.6 |
| | 04/24 | 05/09 | 15.2 | 12.1 | 20.1 | 100 | 27 | 27% | 151.9 |
| | 04/25 | 05/09 | 14.3 | 9.9 | 18.9 | 100 | 20 | 20% | 151.2 |
| | 04/26 | 05/09 | 12.6 | 11.1 | 15.8 | 100 | 35 | 35% | 151.2 |
| | 04/27 | 05/12 | 14.9 | 12.8 | 16.0 | 100 | 28 | 28% | 155.8 |
| | 04/28 | 05/14 | 16.1 | 13.1 | 19.2 | 99 | 29 | 29% | 166.2 |
| | 04/29 | 05/12 | 13.2 | 12.7 | 16.6 | 100 | 25 | 25% | 166.2 |
| | 04/30 | 05/11 | 11.0 | 9.8 | 12.2 | 102 | 29 | 28% | 166.2 |
| | 05/01 | 05/11 | 10.4 | 9.1 | 11.1 | 100 | 32 | 32% | 171.6 |
| | 05/02 | 05/13 | 10.8 | 10.0 | 12.1 | 101 | 35 | 35% | 169.9 |
| | 05/03 | 05/13 | 9.7 | 8.9 | 10.1 | 100 | 33 | 33% | 169.9 |
| | 05/04 | 05/15 | 11.0 | 9.1 | 12.0 | 102 | 36 | 35% | 152.1 |
| | 05/05 | 05/15 | 9.5 | 8.1 | 11.7 | 98 | 28 | 29% | 152.1 |
| | 05/07 | 05/18 | 10.8 | 9.1 | 11.0 | 100 | 31 | 31% | 136.4 |
| | 05/08 | 05/18 | 9.8 | 8.8 | 10.0 | 100 | 37 | 37% | 136.4 |
| 5/9-5/10 | 05/09 | 05/19 | 9.5 | 8.7 | 10.0 | 200 | 31 | 16% | 130.9 |
| 5/11-5/12 | 05/12 | 05/21 | 9.2 | 8.0 | 10.1 | 199 | 35 | 18% | 146.7 |
| 5/13-5/14 | 05/14 | 05/24 | 9.5 | 7.7 | 10.0 | 199 | 26 | 13% | 153.1 |
| 5/15-5/16 | 05/15 | 05/25 | 9.8 | 8.8 | 11.1 | 200 | 32 | 16% | 152.3 |
| 5/17-5/19 | 05/17 | 05/25 | 8.1 | 7.7 | 10.1 | 194 | 25 | 13% | 153.9 |
| 5/20-5/25 | 05/21 | 05/31 | 9.9 | 6.9 | 16.0 | 137 | 9 | 7% | 143.4 |

- Flow at Priest Rapids Dam is the average flow (kcf/s) over the seven day period around the estimated median date of passage.
- Distance from Rock Island Dam to McNary Dam is 161.4 miles.

Table G-9. Travel time of PIT tagged hatchery steelhead smolts from Rock Island Dam to McNary Dam, 1990.

| MULTI-DAY RELEASE | —MEDIAN DATES— | | —TRAVEL TIME (DAYS)— | | | —FISH NUMBER— | | PERCENT DETECTED | PRD FLOW (KCF5) |
|----------------------|----------------|-------|----------------------|--------------------------|-------|---------------|----------|---------------------|-----------------------|
| | RELEASE | RECAP | MEDIAN | —95% CI LIMITS— LOWER | UPPER | RELEASE | DETECTED | | |
| 4/21-4/23 | 04/22 | 05/01 | 8.8 | 7.5 | 11.0 | 120 | 22 | 18% | 157.8 |
| 4/24-4/25 | 04/25 | 05/04 | 9.2 | 7.5 | 10.4 | 114 | 30 | 26% | 154.6 |
| 4/26-4/27 | 04/26 | 05/06 | 9.6 | 7.6 | 10.9 | 139 | 34 | 24% | 151.9 |
| 4/28-4/29 | 04/28 | 05/06 | 7.5 | 6.6 | 8.4 | 127 | 33 | 26% | 152.1 |
| 4/30-5/1 | 05/01 | 05/09 | 7.9 | 6.7 | 8.7 | 138 | 44 | 32% | 166.2 |
| 5/2-5/3 | 05/02 | 05/09 | 7.0 | 6.2 | 7.9 | 143 | 43 | 30% | 166.2 |
| 5/4-5/5 | 05/04 | 05/12 | 7.6 | 6.8 | 9.7 | 142 | 44 | 31% | 162.3 |
| 5/7-5/8 | 05/07 | 05/17 | 9.8 | 8.8 | 10.8 | 139 | 41 | 29% | 139.2 |
| 5/9-5/10 | 05/09 | 05/17 | 7.6 | 7.0 | 8.7 | 140 | 43 | 31% | 130.9 |
| 5/11-5/12 | 05/11 | 05/19 | 7.7 | 7.3 | 8.7 | 142 | 38 | 27% | 137.7 |
| 5/13-5/15 | 05/14 | 05/23 | 8.9 | 7.2 | 9.8 | 209 | 36 | 17% | 153.1 |
| 5/16-5/18 | 05/17 | 05/26 | 8.6 | 7.5 | 9.5 | 209 | 34 | 16% | 153.9 |
| 5/19-5/21 | 05/20 | 05/28 | 7.6 | 6.6 | 8.9 | 159 | 15 | 9% | 143.7 |
| 5/22-5/25 | 05/23 | 05/31 | 8.0 | 7.6 | 9.8 | 179 | 11 | 6% | 139.0 |

- Flow at Priest Rapids Dam is the average flow (kcfs) over the seven day period around the estimated median date of passage.
- Distance from Rock Island Dam to McNary Dam is 161.4 miles.

Table G-10. Travel time of PIT tagged wild steelhead smolts from Rock Island Dam to McNary Dam, 1990.

| MULTI-DAY RELEASE | —MEDIAN DATES— | | —TRAVEL TIME (DAYS)— | | | —FISH NUMBER— | | PERCENT DETECTED | PRD FLOW (KCF5) |
|----------------------|----------------|-------|----------------------|--------------------------|-------|---------------|----------|---------------------|-----------------------|
| | RELEASE | RECAP | MEDIAN | —95% CI LIMITS— LOWER | UPPER | RELEASE | DETECTED | | |
| 4/21-24 | 04/23 | 05/01 | 7.6 | 6.9 | 9.6 | 91 | 25 | 27% | 157.9 |
| 4/25-4/27 | 04/26 | 05/04 | 7.8 | 7.0 | 9.0 | 80 | 28 | 35% | 151.9 |
| 4/28-5/2 | 04/29 | 05/07 | 8.0 | 6.8 | 9.5 | 71 | 23 | 32% | 155.8 |
| 5/3-5/5 | 05/04 | 05/11 | 6.7 | 6.1 | 8.0 | 85 | 33 | 39% | 169.9 |
| 5/7-5/9 | 05/08 | 05/16 | 7.8 | 7.3 | 8.8 | 85 | 29 | 34% | 136.4 |
| 5/10-5/12 | 05/11 | 05/18 | 7.4 | 6.9 | 8.0 | 87 | 30 | 34% | 137.7 |
| 5/13-5/16 | 05/14 | 05/25 | 10.5 | 8.6 | 11.4 | 121 | 30 | 25% | 152.3 |
| 5/17-5/19 | 05/18 | 05/26 | 8.4 | 7.6 | 9.8 | 87 | 29 | 33% | 153.6 |
| 5/20-5/23 | 05/22 | 05/30 | 7.7 | 6.9 | 8.9 | 112 | 16 | 14% | 140.7 |
| 5/24-5/25 | 05/24 | 06/01 | 7.7 | 6.9 | 8.8 | 65 | 19 | 29% | 140.8 |

- Flow at Priest Rapids Dam is the average flow (kcfs) over the seven day period around the estimated median date of passage.
- Distance from Rock Island Dam to McNary Dam is 161.4 miles.

Table G-11. Travel time of freeze branded yearling chinook and steelhead hatchery smolts from release to Lower Granite Dam, 1990.

| BRAND | RELEASE | | LOWER GRANITE DAM | | | | LGR FLOW | MILES TO LGR | SPEED (MI/DAY) | |
|------------------------------|----------------|--------|-------------------|---------------|------|----------------|----------|--------------|----------------|-------|
| | SITE | NUMBER | DATE | PASSAGE INDEX | CODE | RECAPTURE DATE | | | | TTIME |
| SNAKE RIVER YEARLING CHINOOK | | | | | | | | | | |
| LA-T-1 | SAWTOOTH H | 19,875 | 03/17 | 1,522 | D | 04/22 | 36 | 68.6 | 465.8 | 12.9 |
| LA-T-3 | SAWTOOTH H | 18,675 | 03/17 | 1,140 | E | 04/23 | 37 | 68.5 | 465.8 | 12.6 |
| LA-T-4 | SAWTOOTH H | 18,775 | 03/17 | 890 | E | 04/20 | 34 | 65.9 | 465.8 | 13.7 |
| LD-T-1 | SF SALMON R | 20,200 | 03/21 | 329 | E | 05/25 | 65 | 60.0 | 287.9 | 4.4 |
| LD-T-3 | SF SALMON R | 21,100 | 03/22 | 402 | E | 05/20 | 59 | 43.5 | 287.9 | 4.9 |
| LD-T-4 | SF SALMON R | 20,900 | 03/22 | 442 | E | 05/19 | 58 | 44.1 | 287.9 | 5.0 |
| RA-T-1 | RAPID RIVER H | 20,600 | 03/24 • | 4,124 | B | 04/22 | 29 | 68.6 | 174.0 | 6.0 |
| RA-T-2 | RAPID RIVER H | 20,175 | 03/24 * | 4,515 | B | 04/22 | 29 | 68.6 | 174.0 | 6.0 |
| RA-T-3 | RAPID RIVER H | 19,975 | 03/24 • | 4,215 | C | 04/22 | 29 | 68.6 | 174.0 | 6.0 |
| LD-7U-1 | DWORSNAK H | 19,730 | 04/05 | 4,554 | B | 05/06 | 31 | 70.2 | 72.5 | 2.3 |
| RA-7U-1 | DWORSNAK H | 20,239 | 04/05 | 4,922 | B | 04/29 | 24 | 61.1 | 72.5 | 3.0 |
| RA-7U-3 | DWORSNAK H | 19,900 | 04/05 | 5,500 | B | 04/25 | 20 | 67.1 | 72.5 | 3.6 |
| LA-A-2 | LOOKINGGLASS H | 20,406 | 04/02 | 4,443 | B | 04/17 | 15 | 59.5 | 148.6 | 9.9 |
| LA-A-4 | LOOKINGGLASS H | 20,738 | 04/02 | 4,038 | B | 04/19 | 17 | 64.4 | 148.6 | 8.7 |
| RA-A-2 | LOOKINGGLASS H | 20,841 | 04/02 | 4,511 | B | 04/20 | 18 | 65.9 | 148.6 | 8.3 |
| RA-A-4 | LOOKINGGLASS H | 20,801 | 04/02 | 4,382 | B | 04/18 | 16 | 62.4 | 148.6 | 9.3 |
| LA-A-1 | IMNAHA AP | 20,815 | 03/30 * | 2,864 | C | 04/23 | 24 | 68.5 | 133.8 | 5.6 |
| RA-A-1 | IMNAHA AP | 20,170 | 03/30 * | 5,259 | B | 04/23 | 24 | 68.5 | 133.8 | 5.6 |
| SNAKE RIVER STEELHEAD | | | | | | | | | | |
| LA-PP-1 | SAWTOOTH H | 39,454 | 04/12 • | 5,581 | A | 05/26 | 44 | 66.6 | 465.8 | 10.6 |
| RA-PP-1 | EF SALMON R | 40,907 | 04/14 | 5,899 | B | 05/27 | 43 | 76.7 | 441.8 | 10.3 |
| RA-Z-1 | DWORSNAK H | 30,000 | 05/03 | 12,066 | A | 05/11 | 8 | 84.5 | 72.5 | 9.1 |
| RA-T-1 | DWORSNAK H | 30,000 | 05/04 | 11,150 | A | 05/11 | 7 | 84.5 | 72.5 | 10.4 |
| LA-IC-4 | ASOTIN CR | 19,457 | 04/17 | 13,020 | A | 04/23 | 6 | 68.5 | 38.5 | 6.4 |
| RA-IC-4 | ASOTIN CR | 18,793 | 04/18 | 12,166 | A | 04/25 | 7 | 67.1 | 38.5 | 5.5 |
| LD-A-1 | WALLOWA AP | 24,233 | 04/17 * | 8,057 | A | 05/05 | 18 | 66.2 | 182.6 | 10.1 |
| LD-A-3 | WALLOWA AP | 24,903 | 04/17 * | 5,786 | B | 05/03 | 16 | 61.1 | 182.6 | 11.4 |
| RD-A-1 | WALLOWA AP | 25,478 | 04/17 • | 6,843 | B | 05/04 | 17 | 62.4 | 182.6 | 10.7 |
| RD-A-3 | WALLOWA AP | 25,426 | 04/17 * | 6,292 | B | 05/04 | 17 | 62.4 | 182.6 | 10.7 |
| LD-A-2 | SPRING CR CHNL | 24,569 | 04/19 | 4,777 | B | 05/05 | 16 | 66.2 | 182.6 | 11.4 |
| RD-A-2 | SPRING CR CHNL | 24,228 | 04/19 | 6,174 | A | 05/06 | 17 | 70.2 | 182.6 | 10.7 |
| LD-A-4 | WILDCAT CR | 24,739 | 04/25 * | 5,502 | B | 05/05 | 10 | 66.2 | 114.5 | 11.5 |
| RD-A-4 | WILDCAT CR | 22,983 | 04/25 • | 6,968 | A | 05/07 | 12 | 74.4 | 114.5 | 9.5 |
| LD-J-3 | LI SHEEP CR | 26,522 | 04/16 • | 2,199 | C | 05/06 | 20 | 70.2 | 122.0 | 6.1 |
| RD-J-3 | LI SHEEP CR | 24,500 | 04/16 • | 2,408 | C | 05/01 | 15 | 61.1 | 122.0 | 8.1 |

- Release sites are designated H for on-site hatchery release and AP for on-site acclimation pond release. The remaining are stream releases from McCall H (SF Salmon R), Magic Valley H (Sawtooth H and EF Salmon R), Lyons Ferry H (Asotin Cr), Irrigon H (Spring Cr and Wildcat Cr), and Wallowa AP (Little Sheep Cr).
- An asterick designates a release made over a number of days for which an estimated median release date is shown. Release period of 5 days at Rapid River H; 2 days at Imnaha Ap, Sawtooth H, and Little Sheep Cr; and 3 days at Wildcat Cr.
- Code designates range for number of branded fish observed in sample: $A \geq 200$; $100 \leq B < 200$; $50 \leq C < 100$; $30 \leq D < 50$; and $E < 30$.
- TTIME is estimated median travel time in days.
- Flow at Lower Granite Dam is average flow (kcf) over the seven day period around the estimated median date of passage.
- Use the distances reported here between release site and Lower Granite Dam to correct distances, and resulting migration speeds, used in previous annual reports before making comparisons with 1990 migration speeds.

Table G-12. Travel time of freeze branded yearling chinook and steelhead hatchery smolts from Lower Granite Dam to McNary Dam, 1990.

| BRAND | SITE | RELEASE | | —LOWER GRANITE DAM— | | | —MCNARY DAM— | | | INDEX TRAVEL TIME | IHR FLOW |
|------------------------------|----------------|---------|-----------|---------------------|-------------|-------|---------------|-------------|-------|-------------------|----------|
| | | NUMBER | DATE | PASSAGE INDEX | MEDIAN CODE | DATE | PASSAGE INDEX | MEDIAN CODE | DATE | | |
| SNAKE RIVER YEARLING CHINOOK | | | | | | | | | | | |
| LA-T-1 | SAWTOOTH H | 19,875 | 03/17 | 1,522 | D | 04/22 | 403 | D | 05/03 | 11 | 61.9 |
| LA-T-3 | SAWTOOTH H | 18,675 | 03/17 | 1,140 | E | 04/23 | 509 | D | 05/05 | 12 | 62.3 |
| LA-T-4 | SAWTOOTH H | 18,775 | 03/17 | 890 | E | 04/20 | 300 | E | 05/01 | 11 | 64.1 |
| LD-T-1 | SF SALMON R | 20,200 | 03/21 | 329 | E | 05/25 | 478 | E | 06/01 | 7 | 97.0 |
| LD-T-3 | SF SALMON R | 21,100 | 03/22 | 402 | E | 05/20 | 557 | D | 05/31 | 11 | 86.6 |
| LD-T-4 | SF SALMON R | 20,900 | 03/22 | 442 | E | 05/19 | 494 | E | 06/01 | 13 | 86.6 |
| RA-T-1 | RAPID RIVER H | 20,600 | 03/24 | 4,124 | B | 04/22 | 1,284 | C | 05/05 | 13 | 62.3 |
| RA-T-2 | RAPID RIVER H | 20,175 | 03/24 * | 4,515 | B | 04/22 | 1,309 | C | 05/08 | 16 | 61.0 |
| RA-T-3 | RAPID RIVER H | 19,975 | 03/24 • | 4,215 | C | 04/22 | 1,507 | B | 05/04 | 12 | 61.9 |
| LD-7U-1 | DWORSHAK H | 19,730 | 04/05 | 4,554 | B | 05/06 | 1,234 | C | 05/19 | 13 | 67.4 |
| RA-7U-1 | DWORSHAK H | 20,239 | 04/05 | 4,922 | B | 04/29 | 1,371 | C | 05/16 | 17 | 85.5 |
| RA-7U-3 | DWORSHAK H | 19,900 | 04/05 | 5,500 | B | 04/25 | 1,401 | C | 05/11 | 16 | 70.7 |
| LA-A-2 | LOOKINGGLASS H | 20,406 | 04/02 | 4,443 | B | 04/17 | 1,672 | B | 05/05 | 18 | 61.9 |
| LA-A-4 | LOOKINGGLASS H | 20,738 | 04/02 | 4,038 | B | 04/19 | 1,862 | B | 05/04 | 15 | 62.1 |
| RA-A-2 | LOOKINGGLASS H | 20,841 | 04/02 | 4,511 | B | 04/20 | 1,809 | B | 05/04 | 14 | 61.9 |
| RA-A-4 | LOOKINGGLASS H | 20,801 | 04/02 | 4,382 | B | 04/18 | 1,837 | B | 05/04 | 16 | 62.1 |
| LA-A-1 | IMNAHA AP | 20,815 | 03/30 • | 2,864 | C | 04/23 | 1,836 | B | 05/10 | 17 | 67.1 |
| RA-A-1 | IMNAHA AP | 20,170 | 03/30 * | 5,259 | B | 04/23 | 1,748 | B | 05/09 | 16 | 63.7 |
| SNAKE RIVER STEELHEAD | | | | | | | | | | | |
| "A" | GRANDE RONDE R | 196,559 | 4/19-4/25 | 50,399 | A | 05/05 | 1,556 | C | 05/19 | 14 | 67.4 |

- Release sites are designated H for on-site hatchery releases and AP for on-site acclimation pond releases. The remaining include stream releases from McCall H (SF Salmon R) and a pooling of eight ODFW brand groups released at Wallowa AP, Spring Creek channel and Wildcat Creek into a Grande Ronde River drainage group.
- An asterick designates a release made over a number of days for which an estimated median release date is shown. Release period of 5 days at Rapid River H; and 2 days at Imnaha AP.
- Code designates range for number of branded fish observed in sample: $A \geq 200$; $100 \leq B < 200$; $50 \leq C < 100$; $30 \leq D < 50$; and $E < 30$.
- TTIME is estimated median travel time in days.
- Flow at Ice Harbor Dam is average flow (kcfs) over the seven day period around the estimated median date of passage.
- Distance from Lower Granite Dam to McNary Dam is 140 miles.

Table G-13. Travel time of freeze branded steelhead and subyearling chinook hatchery smolts from release in the lower Snake River drainage (below Little Goose Dam) to McNary Dam, 1990.

| BRAND | RELEASE | | | MCNARY DAM | | | | IHR FLOW | MILES TO MCNARY | SPEED (MI/DAY) |
|---------------------------------------|---------------|--------|-------|---------------|------|----------------|-------|----------|-----------------|----------------|
| | SITE | NUMBER | DATE | PASSAGE INDEX | CODE | RECAPTURE DATE | TTIME | | | |
| LOWER SNAKE RIVER SUBYEARLING CHINOOK | | | | | | | | | | |
| RA-UL-1 | LYONS FERRY H | 39,196 | 06/06 | 3,391 | B | 06/30 | 24 | 66.6 | 91.4 | 3.8 |
| RA-UL-3 | LYONS FERRY H | 39,504 | 06/06 | 3,962 | B | 06/29 | 23 | 69.2 | 91.4 | 4.0 |
| LOWER SNAKE RIVER STEELHEAD | | | | | | | | | | |
| LA-IC-1 | TUCANNON AP | 19,352 | NA | • 6,062 | A | 05/16 | NA | NA | 134.5 | NA |
| RA-IC-1 | TUCANNON AP | 19,483 | NA | * 6,339 | A | 05/17 | NA | NA | 134.5 | NA |
| LA-IC-2 | TUCANNON R | 19,219 | 04/25 | 3,219 | A | 05/12 | 17 | 70.7 | 111.5 | 6.6 |
| RA-IC-2 | TUCANNON R | 18,853 | 04/25 | 4,055 | A | 05/11 | 16 | 67.1 | 111.5 | 7.0 |
| LA-IC-3 | LYONS FERRY H | 17,170 | 04/27 | 4,901 | A | 05/11 | 14 | 67.1 | 91.4 | 6.5 |
| RA-IC-3 | LYONS FERRY H | 20,327 | 04/27 | 5,268 | A | 05/12 | 15 | 67.1 | 91.4 | 6.1 |

- Release sites are designated H for on-site hatchery releases and AP for on-site acclimation pond releases. The remaining are stream releases from Lyons Ferry H in the Tucannon River at Marengo.
- An asterick designates a release made over a number of days for which an estimated median release date is shown. Release period of 16 days for Tucannon AP, which is too long for reliable median.
- Code designates range for number of branded fish observed in sample: $A \geq 200$; $100 \leq B < 200$; $50 \leq C < 100$; $30 \leq D < 50$; and $E < 30$.
- TTIME is estimated median travel time in days.
- Flow at Ice Harbor Dam is average flow (kcfs) over the seven day period around the estimated median date of passage at this site.

Table G-14. Travel time of freeze branded chinook and steelhead hatchery smolts in Mid-Columbia River drainage from release to McNary Dam, 1990.

| BRAND | SITE | RELEASE | | MCNARY DAM | | | | PRD FLOW | MILES TO MCNARY | SPEED (MI/DAY) |
|--|-----------------|---------|---------|---------------|-------------|----------------|-------|----------|-----------------|----------------|
| | | NUMBER | DATE | PASSAGE INDEX | SAMPLE CODE | RECAPTURE DATE | TTIME | | | |
| MID-COLUMBIA RIVER YEARLING CHINOOK | | | | | | | | | | |
| LD-7C-1 | WINTHROP H | 14,143 | 04/17 | 1,663 | C | 05/18 | 31 | 169.9 | 282.0 | 9.1 |
| RA-7C-1 | WINTHROP H | 16,745 | 04/17 | 2,816 | B | 05/18 | 31 | 169.9 | 282.0 | 9.1 |
| RA-7C-3 | WINTHROP H | 16,261 | 04/17 | 2,854 | B | 05/17 | 30 | 169.9 | 282.0 | 9.4 |
| RA-7N-1 | ENTIAT H | 17,152 | 04/19 | 3,811 | A | 05/09 | 20 | 151.9 | 202.3 | 10.1 |
| RA-7N-3 | ENTIAT H | 16,791 | 04/19 | 4,505 | A | 05/09 | 20 | 151.9 | 202.3 | 10.1 |
| LA-7T-1 | LEAVENWORTH H | 16,785 | 04/18 | 4,416 | A | 05/15 | 27 | 152.1 | 204.6 | 7.6 |
| LA-7T-3 | LEAVENWORTH H | 15,572 | 04/18 | 4,522 | A | 05/14 | 26 | 152.1 | 204.6 | 7.9 |
| RD-7T-1 | LEAVENWORTH H | 15,521 | 04/18 | 4,029 | A | 05/14 | 26 | 152.1 | 204.6 | 7.9 |
| RA-Y-1 | LEAVENWORTH H | 12,400 | 05/04 | 2,401 | B | 05/21 | 17 | 130.9 | 204.6 | 12.0 |
| RA-Y-2 | LEAVENWORTH H | 12,100 | 05/04 | 2,806 | B | 05/22 | 18 | 133.1 | 204.6 | 11.4 |
| RA-Y-3 | LEAVENWORTH H | 13,100 | 05/04 | 2,844 | B | 05/22 | 18 | 133.1 | 204.6 | 11.4 |
| RA-Y-4 | LEAVENWORTH H | 14,200 | 05/04 | 2,532 | B | 05/21 | 17 | 130.9 | 204.6 | 12.0 |
| LA-7S-1 | RINGOLD H | 19,711 | 03/31 • | 8,132 | A | 04/08 | 8 | 150.7 | 56.0 | 7.0 |
| LA-7S-3 | RINGOLD H | 20,125 | 03/31 • | 8,785 | A | 04/07 | 7 | 151.9 | 56.0 | 8.0 |
| MID-COLUMBIA RIVER SUBYEARLING CHINOOK | | | | | | | | | | |
| LA-H-1 | WELLS H | 46,425 | 05/23 * | 2,814 | B | 07/02 | 40 | 240.0 | 223.6 | 5.6 |
| LA-H-2 | WELLS H | 46,276 | 05/23 * | 2,804 | B | 07/01 | 39 | 240.0 | 223.6 | 5.7 |
| RA-H-1 | FRIEST RAPIDS H | 37,392 | 06/07 | 11,468 | A | 06/20 | 13 | 205.3 | 105.1 | 8.1 |
| RA-H-2 | FRIEST RAPIDS H | 37,121 | 06/10 | 10,696 | A | 06/21 | 11 | 199.7 | 105.1 | 9.6 |
| RD-H-1 | FRIEST RAPIDS H | 38,717 | 06/13 | 7,530 | A | 06/24 | 11 | 208.7 | 105.1 | 9.6 |
| RA-UP-3 | FRIEST RAPIDS H | 39,924 | 06/16 | 13,958 | A | 06/26 | 10 | 225.1 | 105.1 | 10.5 |
| RA-UP-1 | FRIEST RAPIDS H | 39,904 | 06/19 | 12,399 | A | 06/28 | 9 | 210.6 | 105.1 | 11.7 |
| MID-COLUMBIA RIVER STEELHEAD | | | | | | | | | | |
| LD-7H-1 | SIMILKAMEEN R | 19,855 | 04/24 * | 5,823 | A | 05/16 | 22 | 144.7 | 315.6 | 14.3 |
| LD-7H-3 | SIMILKAMEEN R | 18,868 | 04/24 * | 5,300 | A | 05/16 | 22 | 144.7 | 315.6 | 14.3 |
| RA-7H-1 | METHOW R | 14,716 | 04/26 | 2,855 | B | 05/12 | 16 | 171.6 | 241.9 | 15.1 |
| RA-7H-3 | METHOW R | 14,793 | 04/25 * | 2,829 | B | 05/11 | 16 | 166.2 | 241.9 | 15.1 |
| LA-S-1 | TOUCHET AP | 19,039 | NA • | 4,014 | A | 05/15 | NA | NA | 98.2 | NA |
| RA-S-1 | TOUCHET AP | 18,870 | NA * | 3,557 | A | 05/12 | NA | NA | 98.2 | NA |
| LA-S-2 | WALLA WALLA R | 19,168 | 04/24 | 2,708 | B | 05/18 | 24 | NA | 39.0 | 1.6 |
| RA-S-2 | WALLA WALLA R | 19,094 | 04/25 | 2,644 | B | 05/16 | 21 | NA | 39.0 | 1.9 |

- Release sites are designated H for on-site hatchery releases and AP for on-site acclimation pond releases. The remaining are stream releases from Lyons Ferry H (Walla Walla R) and Wells Hatchery (Methow R and Similkameen R).
- An asterick designates a release made over a number of days for which an estimated median release date is shown. Release period of 8 days at Ringold H; 4 days at Wells H; 2 days for Similkameen and Methow rivers; and 16 days at Touchet AP, which is too long for reliable median.
- Code designates range for number of branded fish observed in sample: $A \geq 200$; $100 \leq B < 200$; $50 \leq C < 100$; $30 \leq D < 50$; and $E < 30$.
- TTIME is estimated median travel time in days.
- Flow at Priest Rapids Dam is average flow (kcfs) over the seven day period around the estimated median date of passage at this site.
- Flow for Ringold and Priest Rapids hatcheries is average of Priest Rapids Dam flow for release date and subsequent three days after release.

Table G-15. Travel time of freeze branded yearling chinook and steelhead smolts from McNary Dam (site of marking and release) to John Day Dam, 1990.

| BRAND GROUP | —RELEASE DATES— | | —RELEASE NUMBER— | | —JOHN DAY DAM— | | | —TRAVEL TIME— | | JDA FLOW |
|------------------|-----------------|-----------|------------------|-------|----------------|---------------|------------------|---------------|---------|----------|
| | ACTUAL | USED | ACTUAL | USED | SAMPLE NUMBER | PASSAGE INDEX | RECOVERY PERCENT | MEDIAN | 95% CI | |
| YEARLING CHINOOK | | | | | | | | | | |
| "IX" | 4/9-4/13 | 4/11-4/13 | 2,884 | 1,447 | 6 | 82 | 5.7% | NA | NA | NA |
| "10" | 4/30-5/4 | SAME | 5,881 | 5,881 | 36 | 502 | 8.5% | 5.3 | 4.5-7.5 | 234.4 |
| "15" | 5/7-5/11 | SAME | 5,900 | 5,900 | 31 | 409 | 6.9% | 5.3 | 3.5-7.5 | 231.8 |
| "ID" | 5/14-5/18 | SAME | 5,900 | 5,900 | 24 | 293 | 5.0% | 5.2 | 3.5-9.5 | 195.6 |
| "IF" | 5/21-5/25 | 5/21 | 5,179 | 1,180 | 9 | 112 | 9.5% | NA | NA | NA |
| STEELHEAD | | | | | | | | | | |
| "13" | 4/30-5/5 | SAME | 6,000 | 6,000 | 53 | 731 | 12.2% | 4.0 | 2.5-5.5 | 234.5 |
| "17" | 5/6-5/11 | SAME | 3,925 | 3,925 | 37 | 483 | 12.3% | 4.5 | 2.5-7.5 | 230.1 |
| "IV" | 5/14-5/18 | SAME | 4,334 | 4,334 | 45 | 554 | 12.8% | 4.6 | 3.5-6.5 | 193.0 |
| "15" | 5/21-5/25 | 5/21 | 1,506 | 357 | 4 | 49 | 13.7% | NA | NA | NA |
| "IM" | 5/28-6/1 | NONE | 4,430 | 0 | 0 | 0 | NA | NA | NA | NA |

- Sample number, passage index, and recovery percent based on fish released during the "used" dates. Outages in Unit 5 precluded using data from releases made before April 11 and after May 21.
- NA designates that data is not available, because too few marked fish were recovered for estimation of median travel time. For these weeks, the range of the individual smolt travel times are shown below.
 - (1) yearling chinook: "IX" 11.5-22.5 days;
"IF" 3.5-6.5 days;
 - (2) steelhead: "15" 3.5-6.5 days;
"IM" had no recovered at John Day Dam.
- Distance from McNary Dam to John Day Dam is 76.4 miles.
- Flow at John Day Dam is computed in two steps: Initially, an average flow is computed over a period of days equal to the overall travel time estimate, beginning the midnight subsequent to each daily release. Finally, a weighted average, using number released each day as the weight, of these average flows is computed to represent the index reach flow for a particular week's marked group.