

**Appendix A: Detailed results from the SAR and T:M modeling for fish transported from Lower Granite Dam.**

For each migration year (MY) and fish grouping (wild Chinook salmon, hatchery Chinook salmon, wild steelhead, hatchery steelhead), we tested a suite of 19 models (Table A1) to investigate the relation between SAR and factors day of year, release location (at or above Lower Granite Dam), mode of migration (Transported or Migrant), and the interactions of factors. The best fitting models based on QAIC<sub>c</sub> are listed in Table A2 and corresponding SARs and T:M ratios are illustrated in Figures A1-A42. Information regarding the best fitting T:M curves relative to standards for comparison is summarized in color-coded summary charts in the main text (Figures 2-5).

**Table A1.** Possible models for Lower Granite transport data. Codes for factors: D—day of year; L—Release location (at LGR or above LGR); T—Mode of migration (Transported or Migrant). In the list of models, a “+” means the factor entered the model additively, and a “\*” means there was an interaction between the terms.

#	Model
0	0
1	D
2	L
3	T
4	D + L
5	D + T
6	L + T
7	D + L + T
8	D + L + D*L
9	D + T + D*T
10	L + T + L*T
11	D + L + T + D*L
12	D + L + T + D*T
13	D + L + T + L*T
14	D + L + T + D*L + D*T
15	D + L + T + D*L + L*T
16	D + L + T + D*T + L*T
17	D + L + T + D*L + D*T + L*T
18	D + L + T + D*L + D*T + L*T + D*L*T

**Table A2.** Best fitting models based on QAIC<sub>c</sub>. Codes for factors: D—day of year; L—Release location (at LGR or above LGR); T—Mode of migration (Transported or Migrant). In the list of factors a “+” means the factor entered the model additively, and a “\*” means there was an interaction between the terms.

MY	Model	Factors affecting SAR
<b>Wild Chinook Salmon</b>		
1998	14	D + L + T + D*L + D*T
1999	12	D + L + T + D*T
2000	4	D + L
2001	5	D + T
2002	17	D + L + T + D*L + D*T + L*T
2003	11	D + L + T + D*L
2004	12	D + L + T + D*T
2005	9	D + T + D*T
2006	18	D + L + T + D*L + D*T + L*T + D*L*T
2007	18	D + L + T + D*L + D*T + L*T + D*L*T
2008	7	D + L + T
<b>Hatchery Chinook Salmon</b>		
1998	14	D + L + T + D*L + D*T
1999	14	D + L + T + D*L + D*T
2000	9	D + T + D*T
2001	5	D + T
2002	9	D + T + D*T
2003	3	T
2004	5	D + T
2005	6	L + T
2006	15	D + L + T + D*L + L*T
2007	7	D + L + T
2008	18	D + L + T + D*L + D*T + L*T + D*L*T
<b>Wild Steelhead</b>		
1998	1	D
1999	6	L + T
2000	8	D + L + D*L
2001	9	D + T + D*T
2002	7	D + L + T
2003	13	D + L + T + L*T
2004	11	D + L + T + D*L
2005	7	D + L + T
2006	5	D + T
2007	12	D + L + T + D*T

**Table A2** (continued).

MY	Model	Factors affecting SAR
<b>Hatchery Steelhead</b>		
1998	1	D
1999	14	D + L + T + D*L + D*T
2000	14	D + L + T + D*L + D*T
2001	14	D + L + T + D*L + D*T
2002	1	D
2003	9	D + T + D*T
2004	5	D + T
2005	11	D + L + T + D*L
2006	16	D + L + T + D*T + L*T
2007	12	D + L + T + D*T

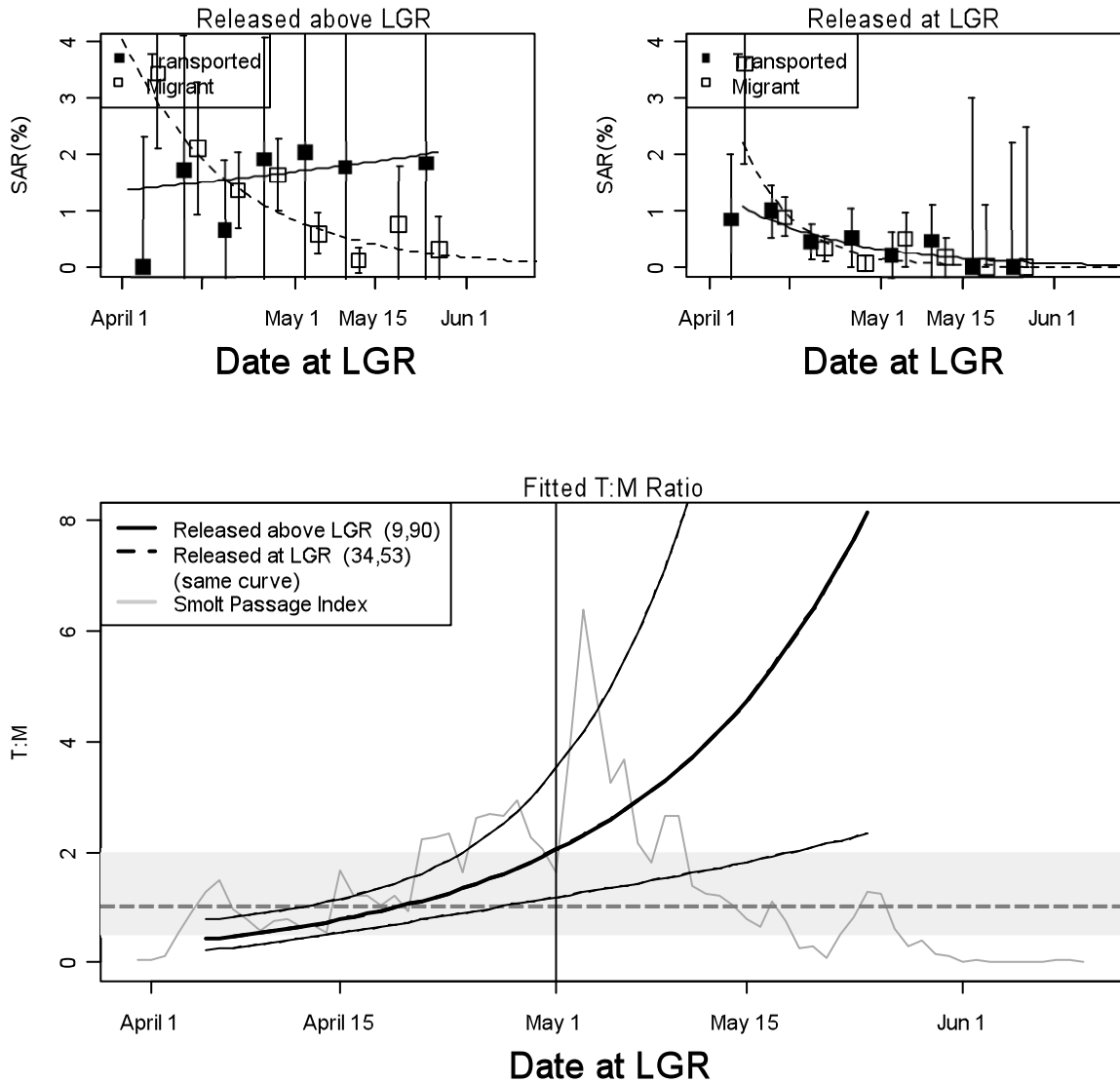
Each of three factors tested was important in a majority of the best fitting models, with date occurring in 39 of 42 cases, release location occurring in 28 of 42 cases, and mode of migration occurring in 37 of 42 cases (Table A1). Many of the best fitting models also contained interactions, meaning that the slope of the SAR relationships varied across values of the factors (e.g., T:M ratio depended on date). In 2 of the 5 cases when mode of migration was not included in the best fitting model (1998 wild steelhead and 2002 hatchery steelhead), there were no PIT-tagged transported fish, so no comparison was possible. In the other three cases, SARs of transported fish and migrants were not statistically different. Accordingly, the estimated T:M ratio was equal to 1.0 across the entire season in these cases. (It is likely that the T:M ratio was also not significantly different from the adjusted-baseline standard, though we did not conduct formal statistical tests of this hypothesis). Similarly, in some cases when release location was not included in the best fitting model, PIT-tagged fish were released at only one of the locations, so comparisons were not possible.

When factors mode of migration and release location appeared in the model but their interaction did not (Models 7, 11, 12, and 14), it indicated that SARs differed according to release location, but the T:M ratio was the same for both release locations. This occurred in 17 cases (Table A1 and Figures A1-A42). When the model included the interaction between mode of migration and release location (Models 10, 13, 15-18), both SARs and T:M ratios differed between release location. This occurred seven times (Table A1 and Figures A1-A42).

In the figures that follow (Figures A1 – A42), SAR (%) and Transport:Migrant (T:M) ratios are plotted versus date for each migration year and fish grouping based on the best fitting models (Table A2). SARs are measured from outmigration at Lower Granite Dam to adult return to Lower Granite Dam. For the fitted T:M relationships, different curves are plotted if the best fitting model included differences in T:M ratio between fish released above Lower Granite Dam and those released at the dam. If the model did not include differences, a single curve is plotted. In this latter case, if the two released locations covered different time periods, the single curve is solid (representing fish released above LGR or an overlap between both release locations) or dashed (representing fish released at LGR) depending on when data were available. The scale of the y-axis for T:M ratio varies from figure to figure. To provide a visual cue to the varying scales, each figure has a shaded region (“stripe”) that spans T:M = 0.5 to T:M = 2.0.

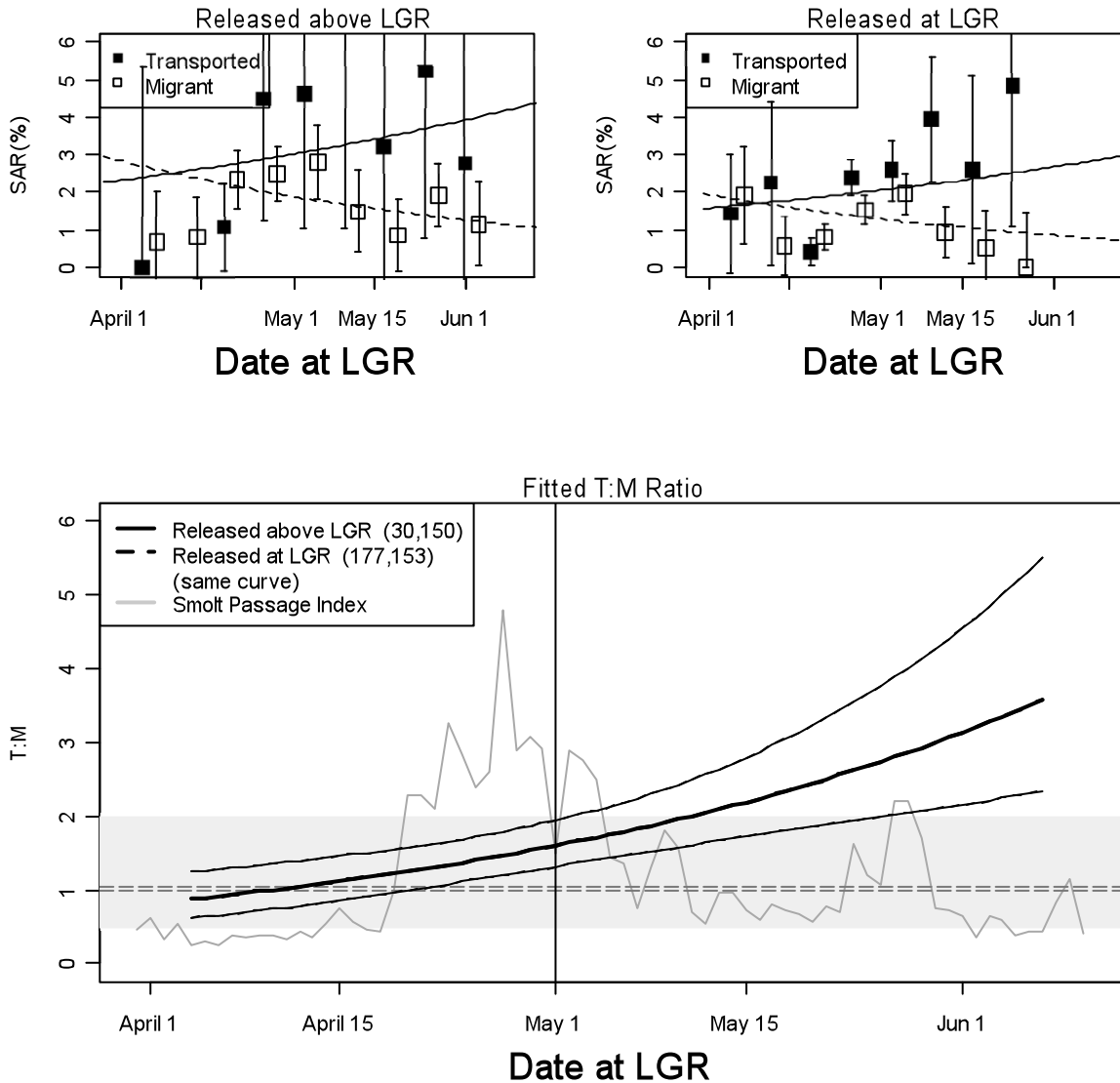
Substantial variability exists in the details of the *SAR* and T:M plots (Figures A1 – A42). Regarding the relationship between estimated T:M ratios and standards for comparison, information contained in these plots is summarized in color-coded charts in the main text (Figures 2-5).

## Wild Chinook 1998



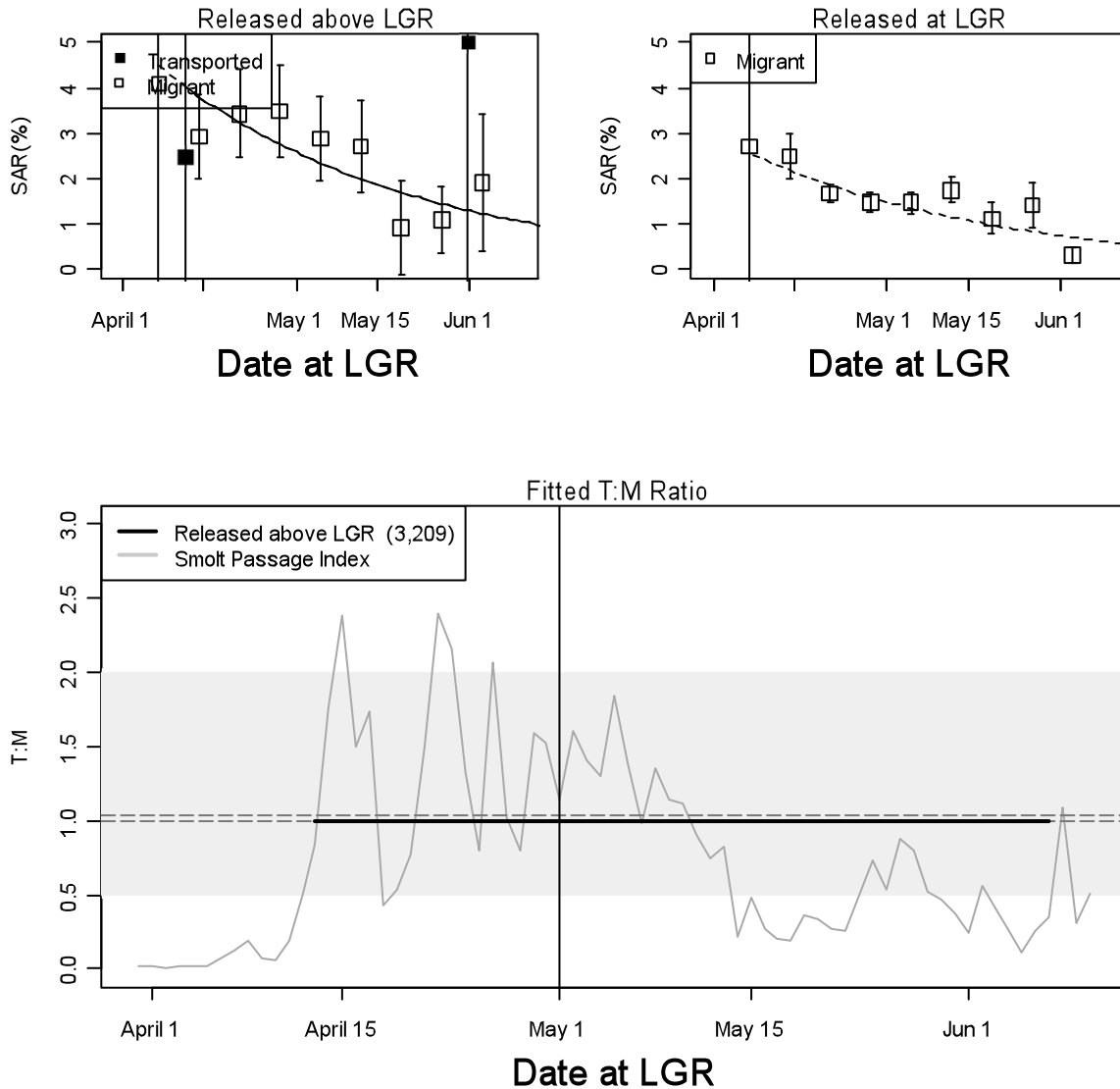
**Figure A1.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild spring/summer Chinook salmon from migration year 1998. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Chinook 1999



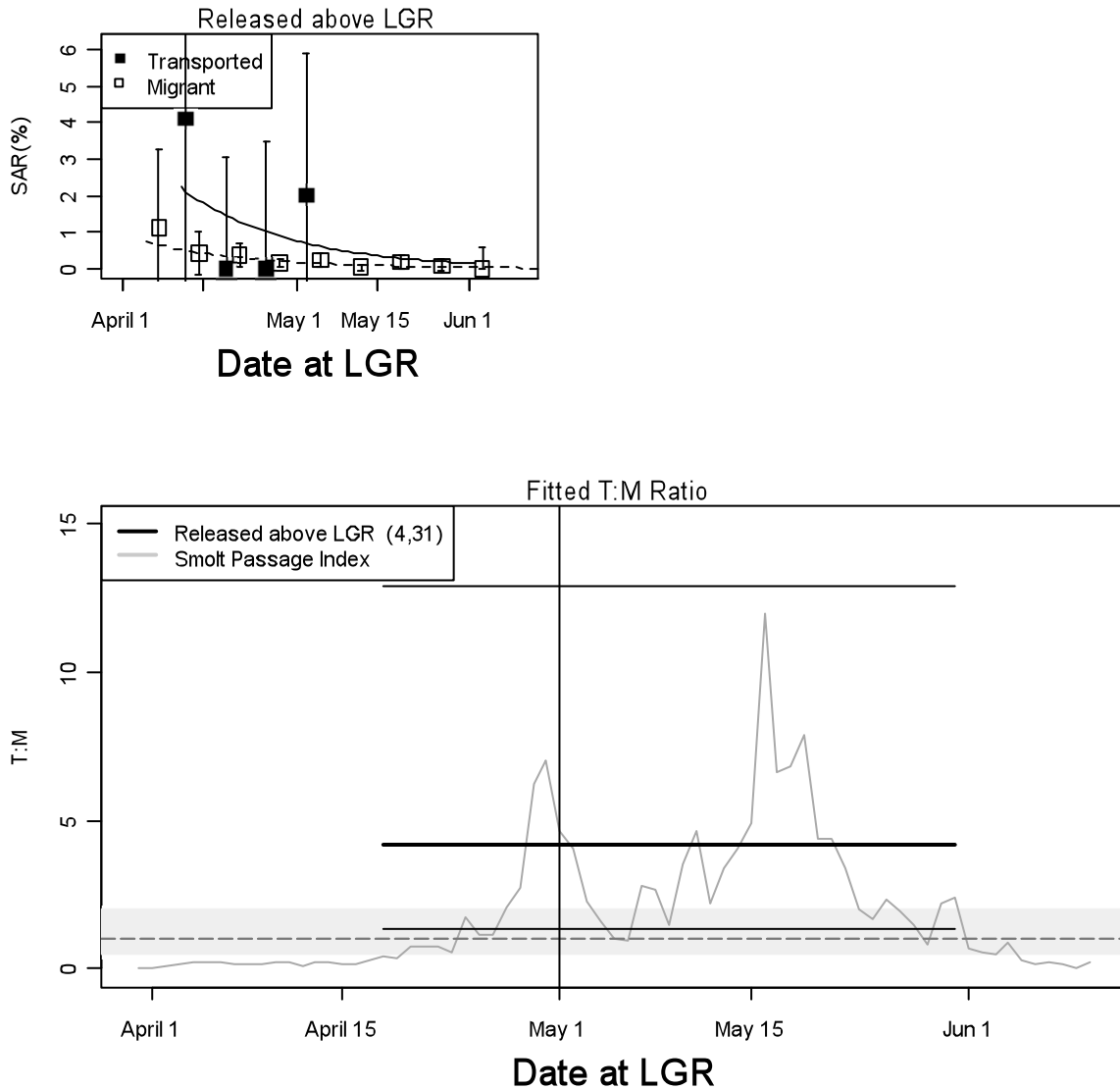
**Figure A2.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild spring/summer Chinook salmon from migration year 1999. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Chinook 2000



**Figure A3.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild spring/summer Chinook salmon from migration year 2000. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

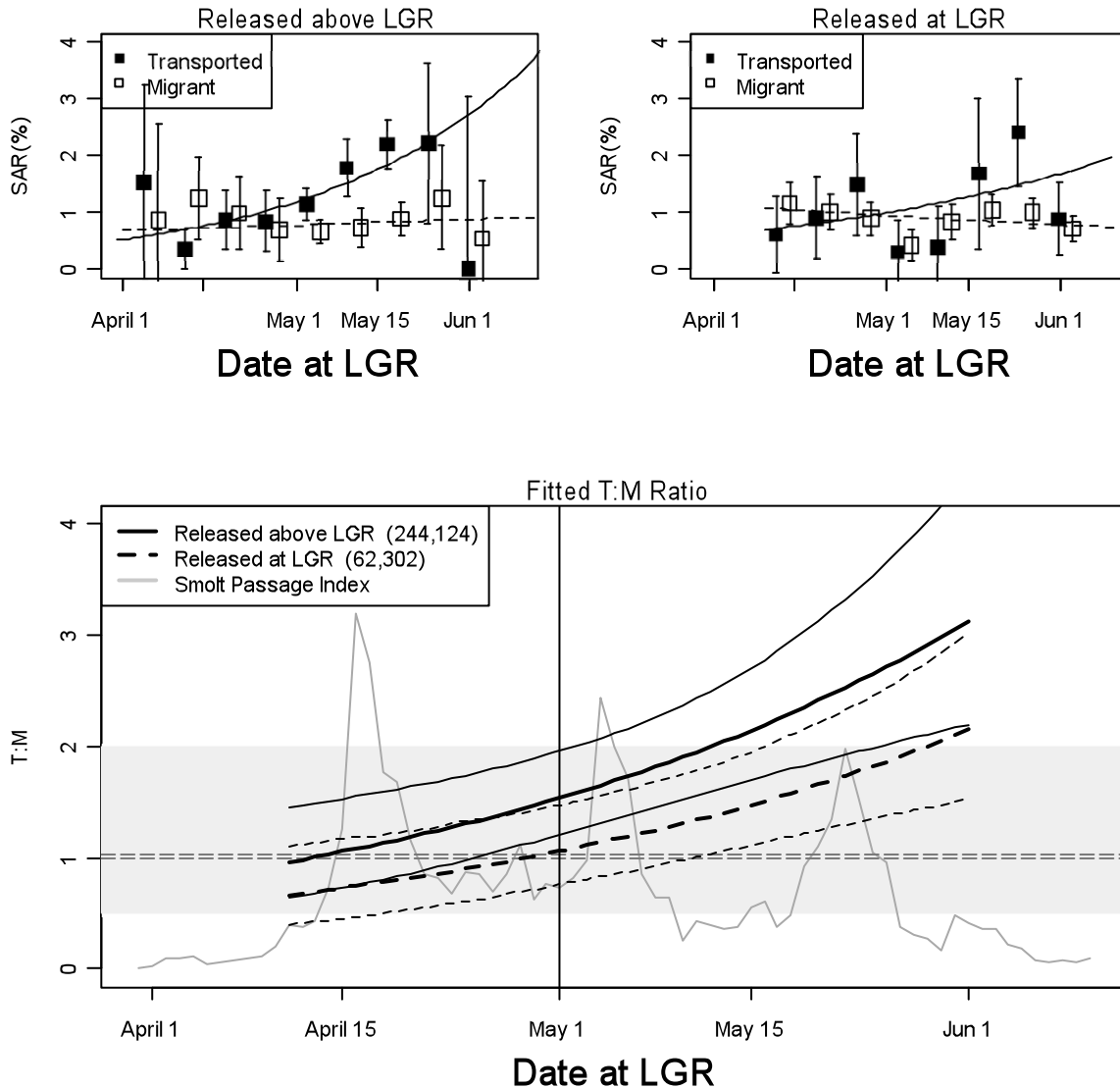
## Wild Chinook 2001



**Figure A4.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild spring/summer Chinook salmon from migration year 2001. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

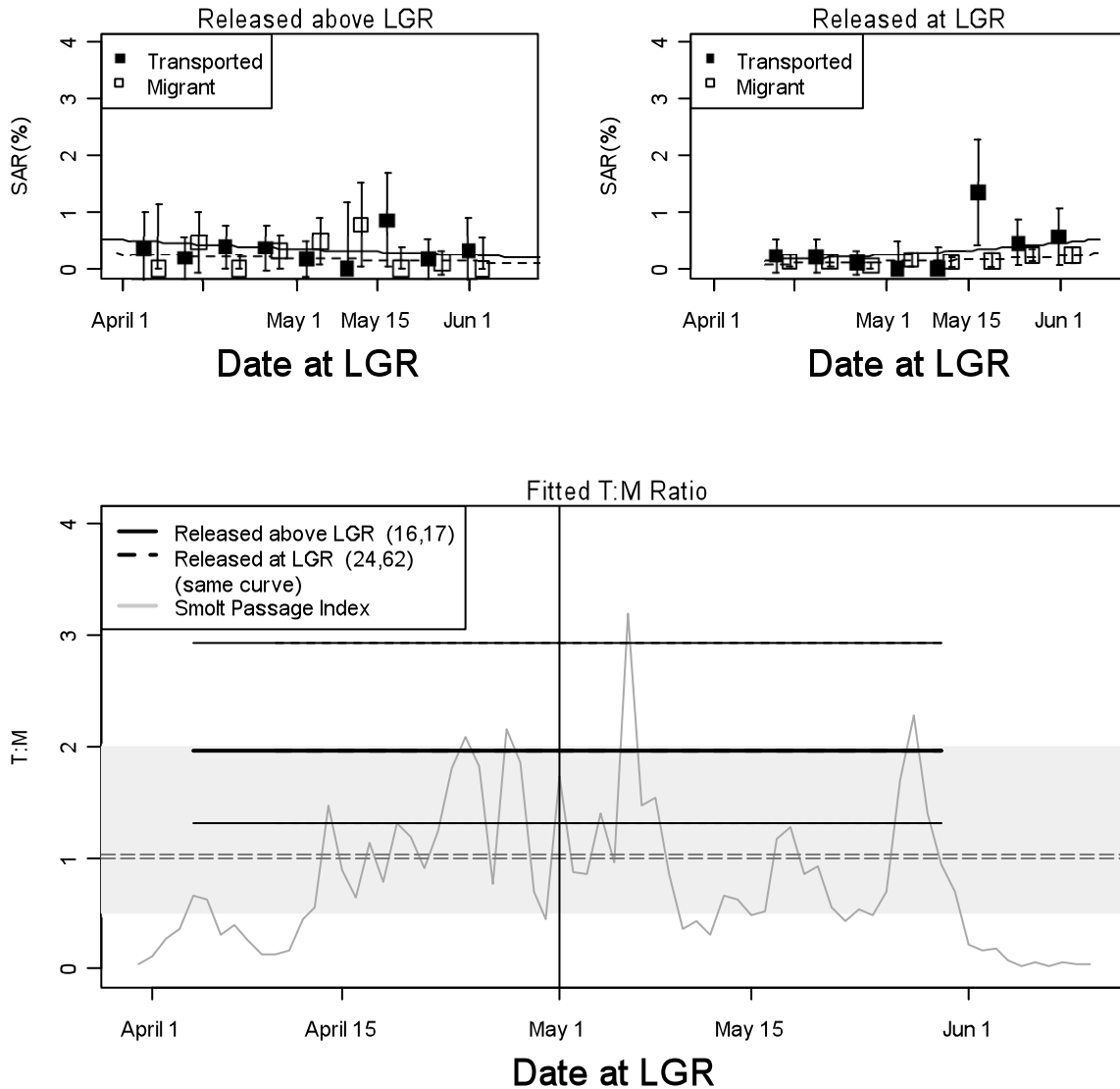


## Wild Chinook 2002



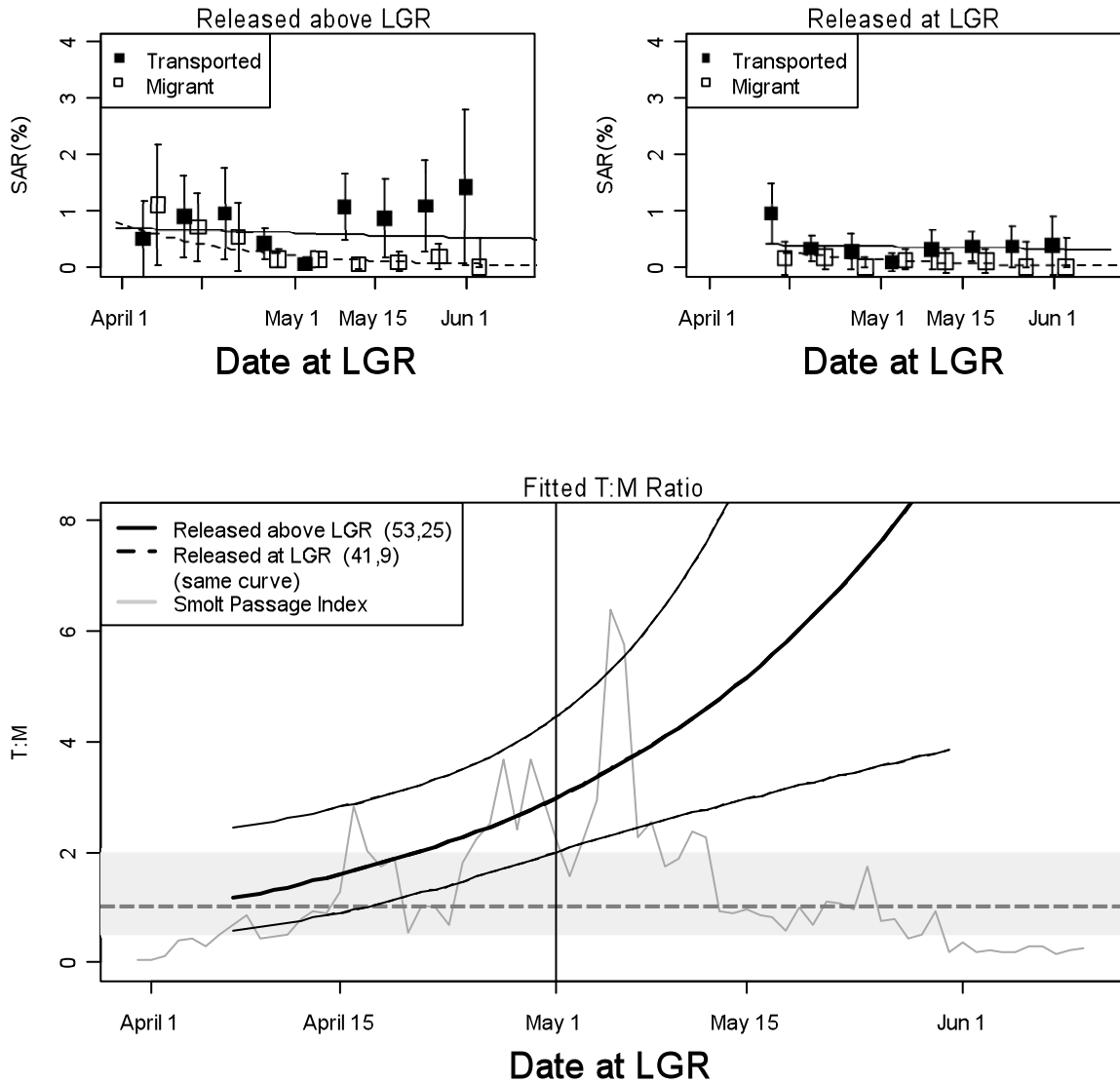
**Figure A5.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild spring/summer Chinook salmon from migration year 2002. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Chinook 2003



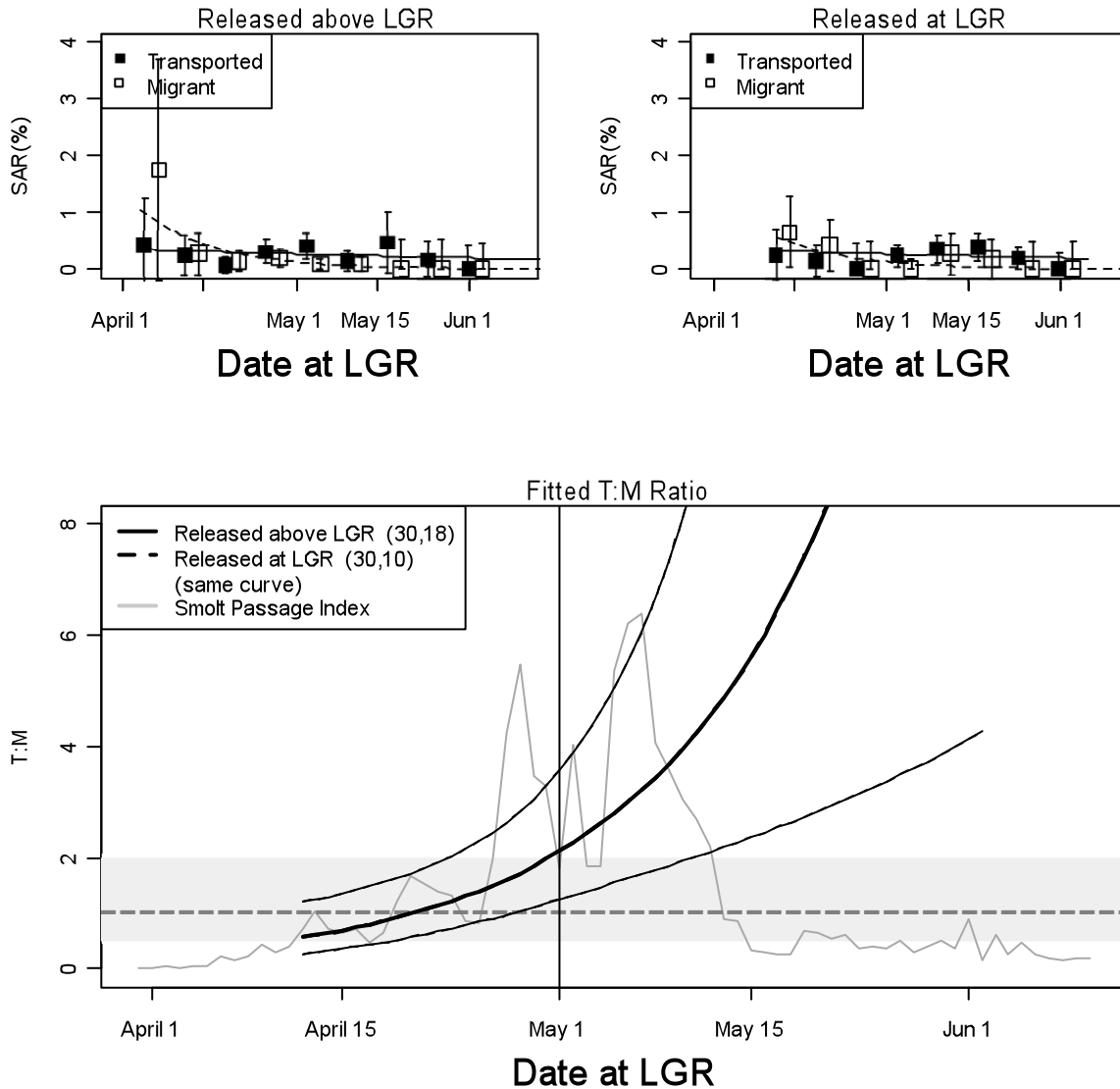
**Figure A6.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild spring/summer Chinook salmon from migration year 2003. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Chinook 2004



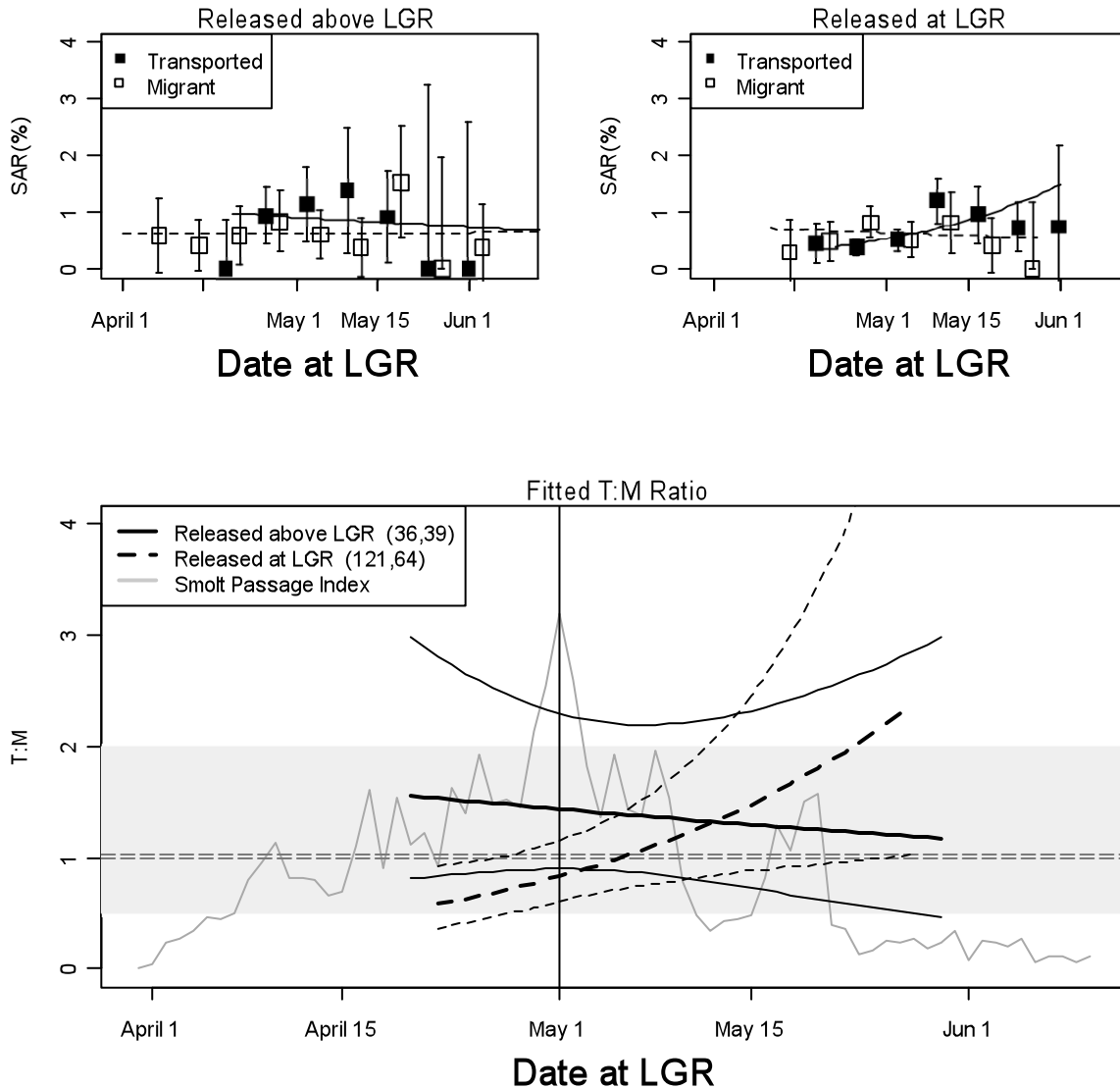
**Figure A7.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild spring/summer Chinook salmon from migration year 2004. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Chinook 2005



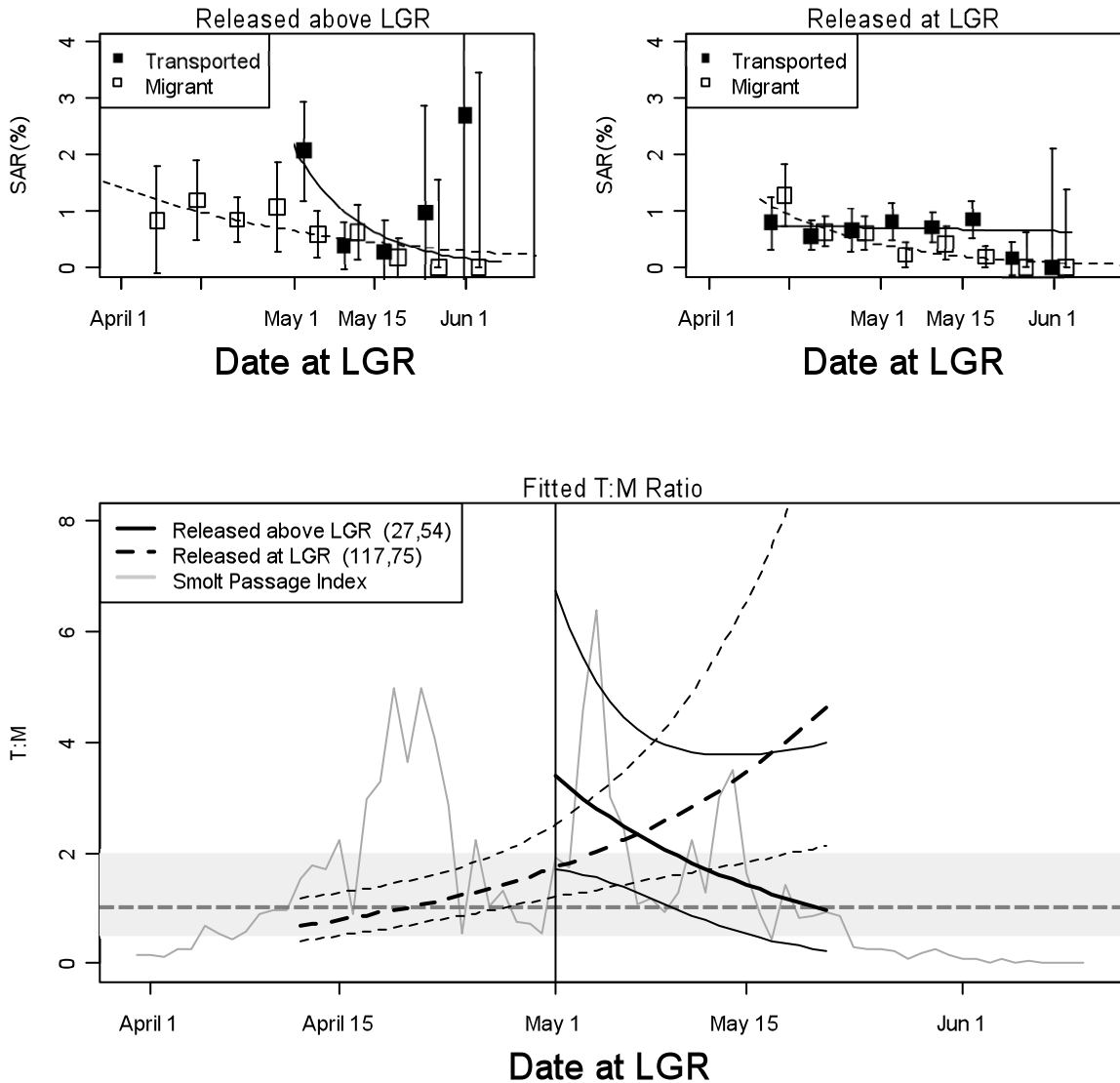
**Figure A8.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild spring/summer Chinook salmon from migration year 2005. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Chinook 2006



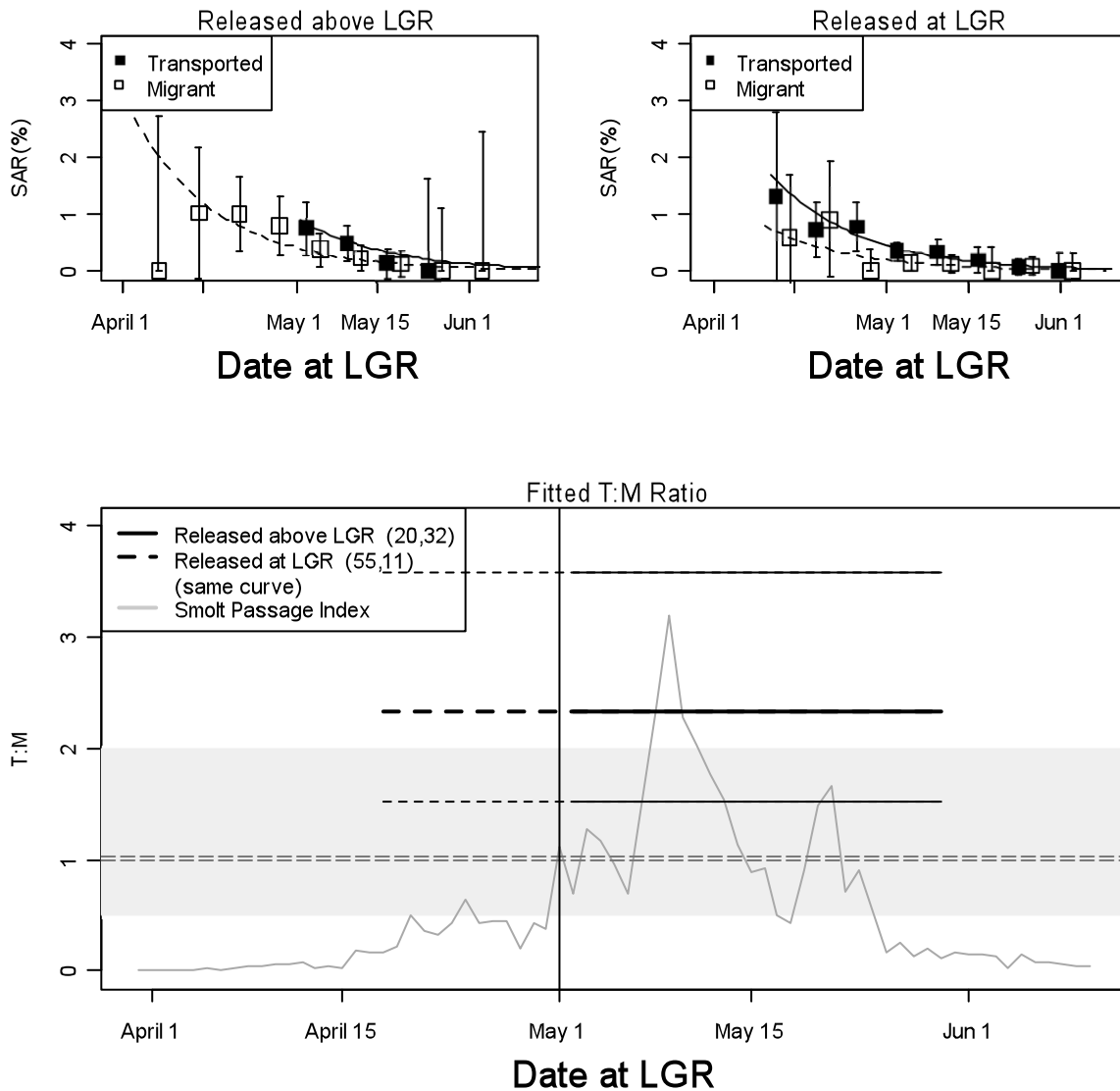
**Figure A9.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild spring/summer Chinook salmon from migration year 2006. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Chinook 2007



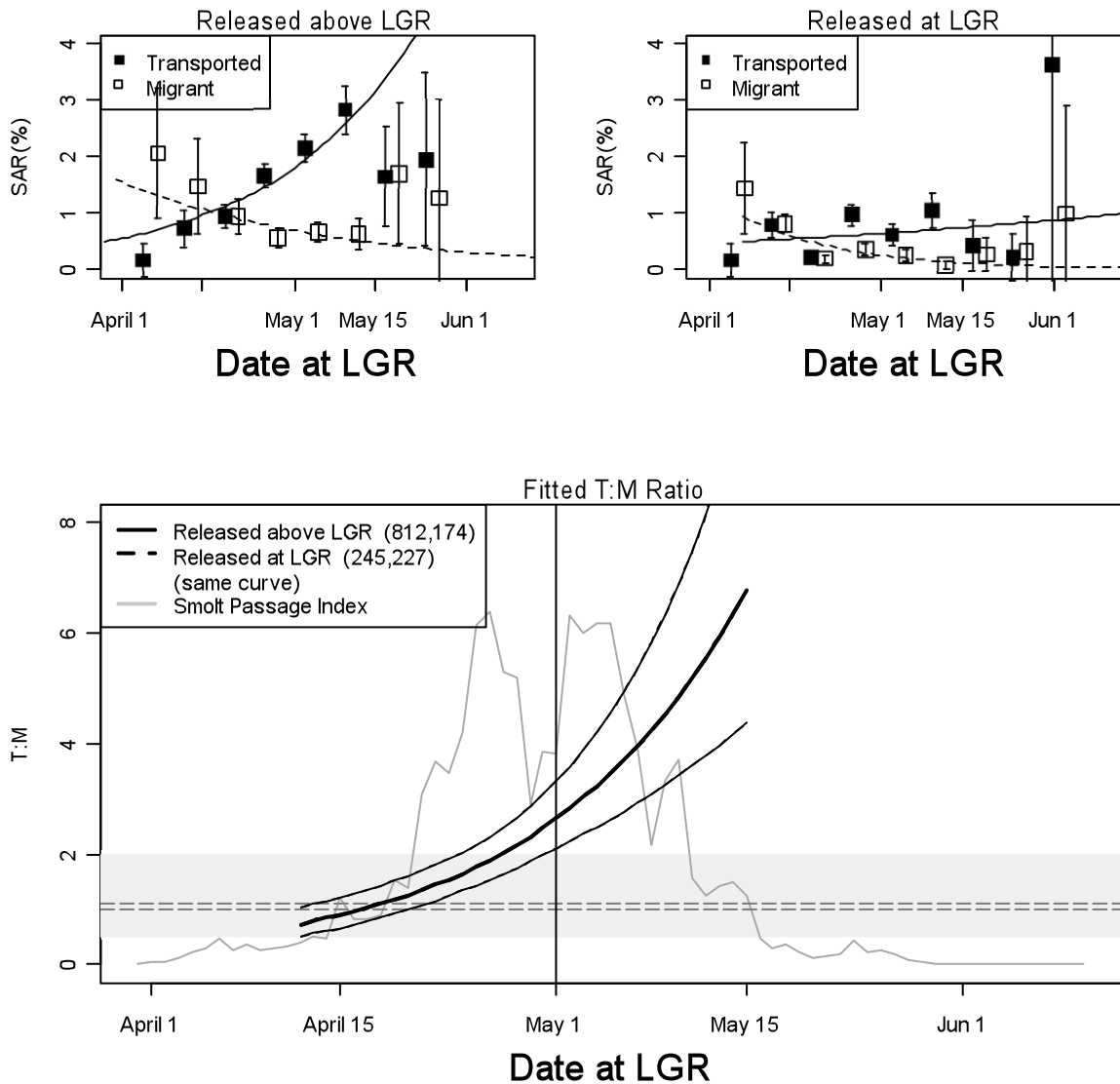
**Figure A10.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild spring/summer Chinook salmon from migration year 2007. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Chinook 2008



**Figure A11.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild spring/summer Chinook salmon from migration year 2008. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

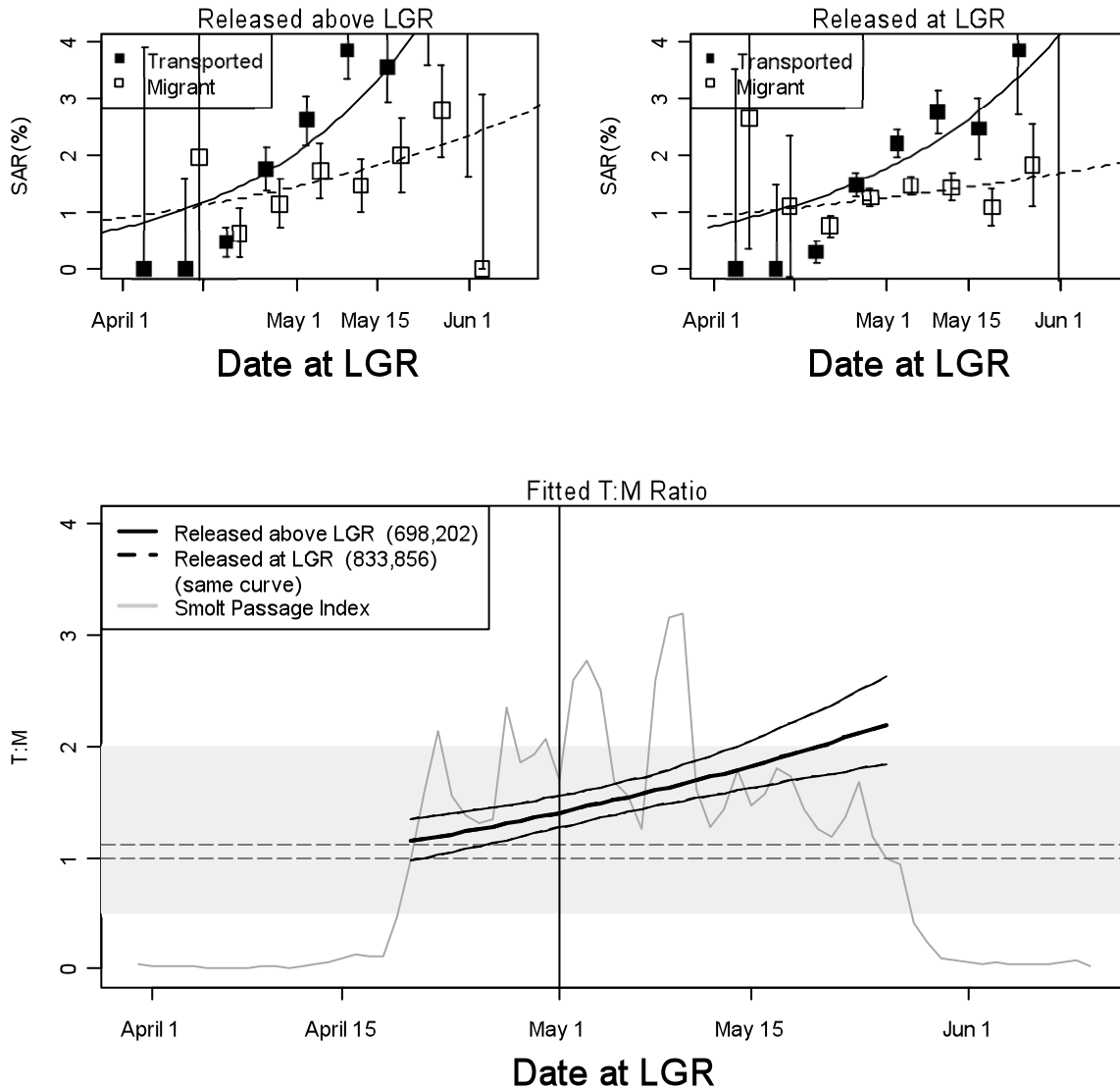
## Hatchery Chinook 1998



**Figure A12.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery spring/summer Chinook salmon from migration year 1998. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

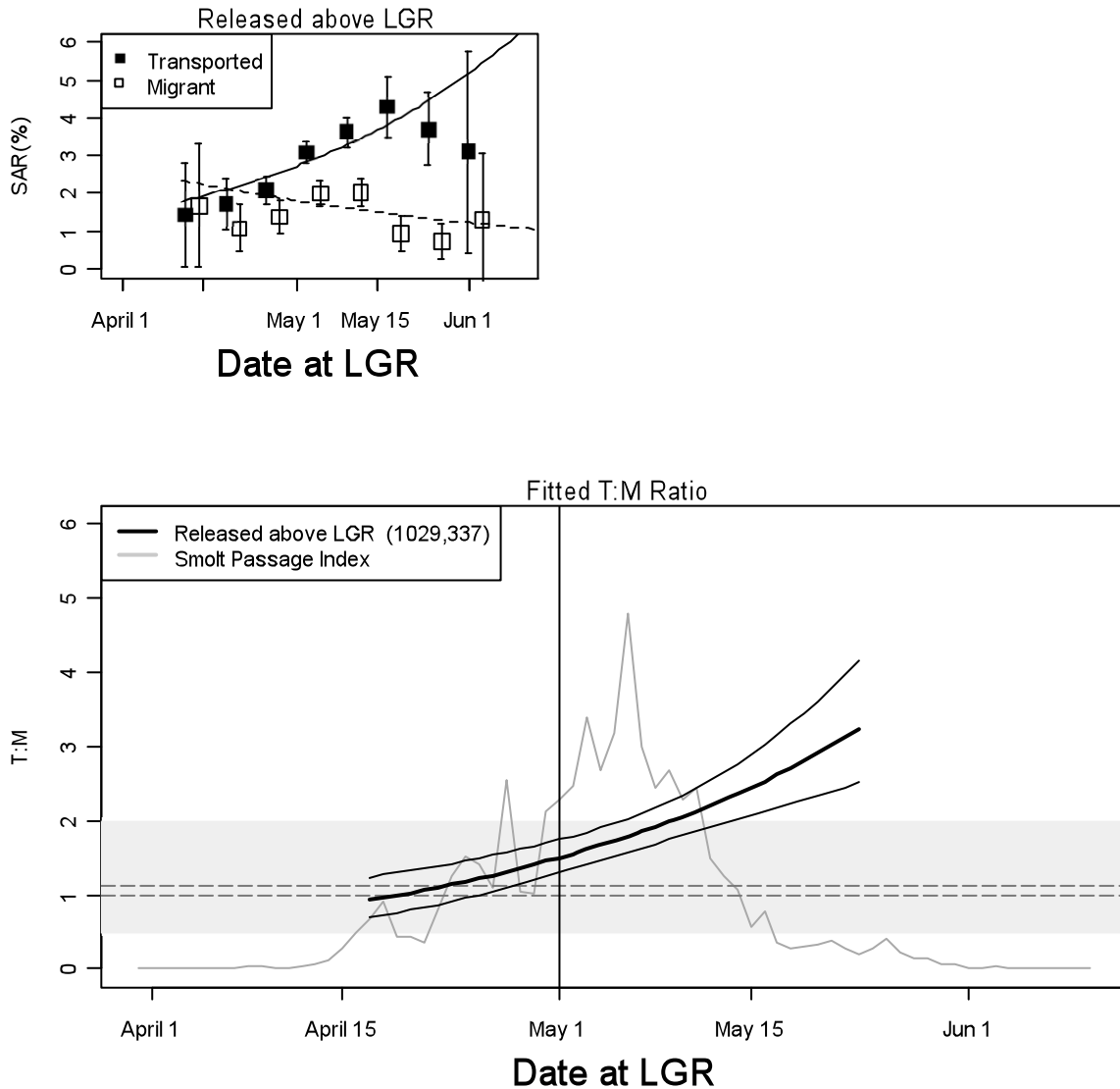


## Hatchery Chinook 1999



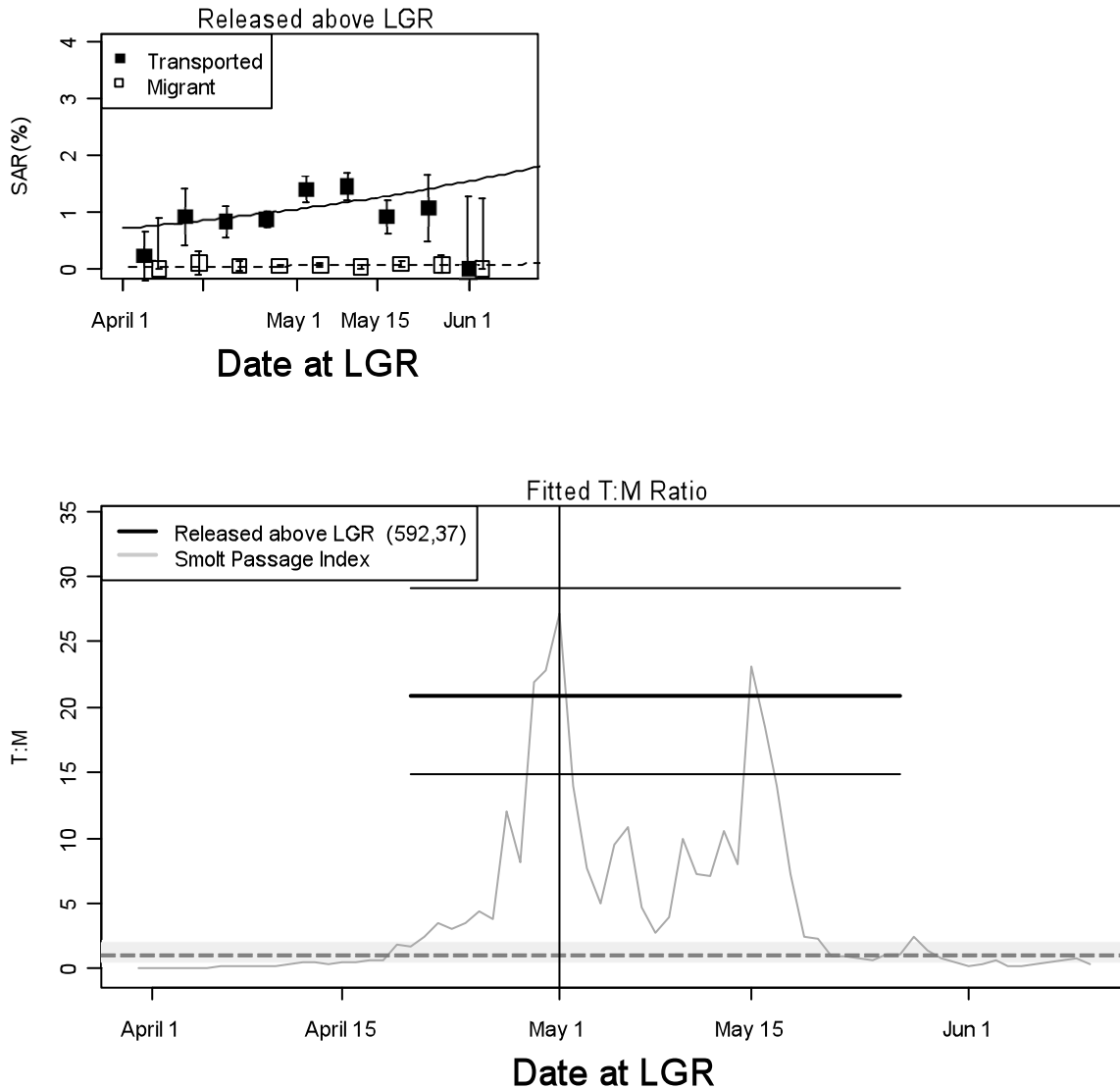
**Figure A13.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery spring/summer Chinook salmon from migration year 1999. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Chinook 2000



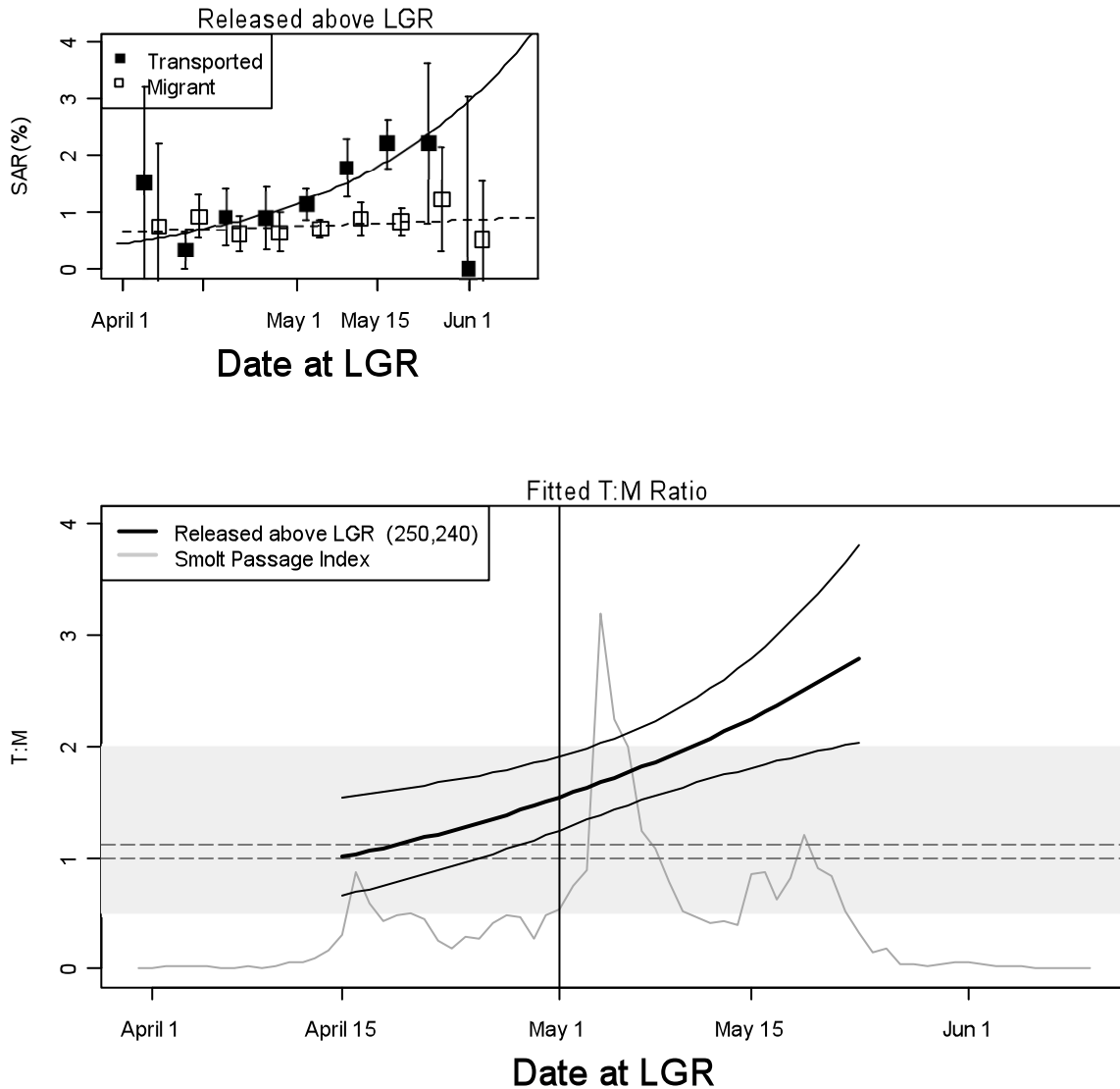
**Figure A14.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery spring/summer Chinook salmon from migration year 2000. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Chinook 2001



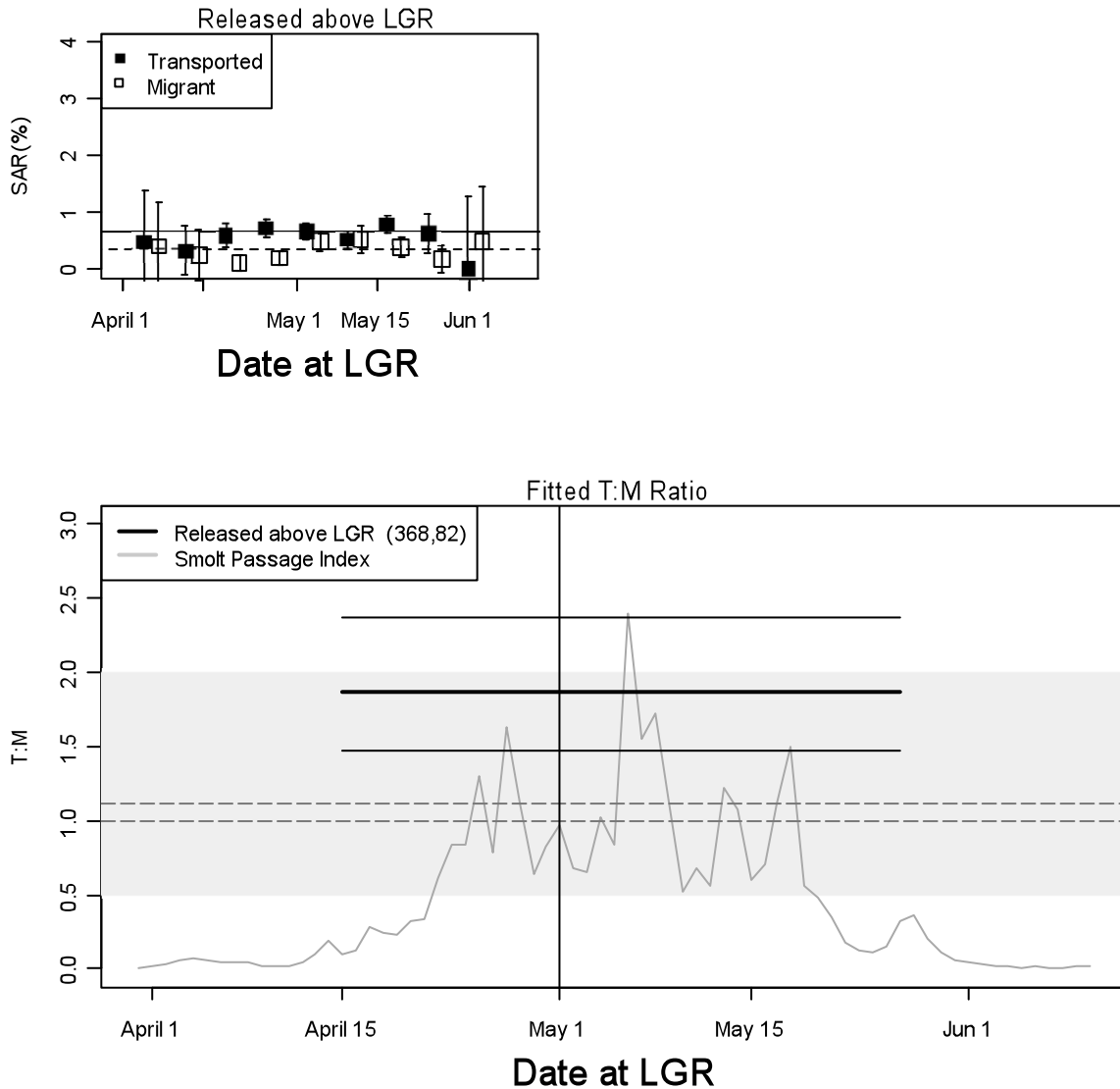
**Figure A15.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery spring/summer Chinook salmon from migration year 2001. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Chinook 2002



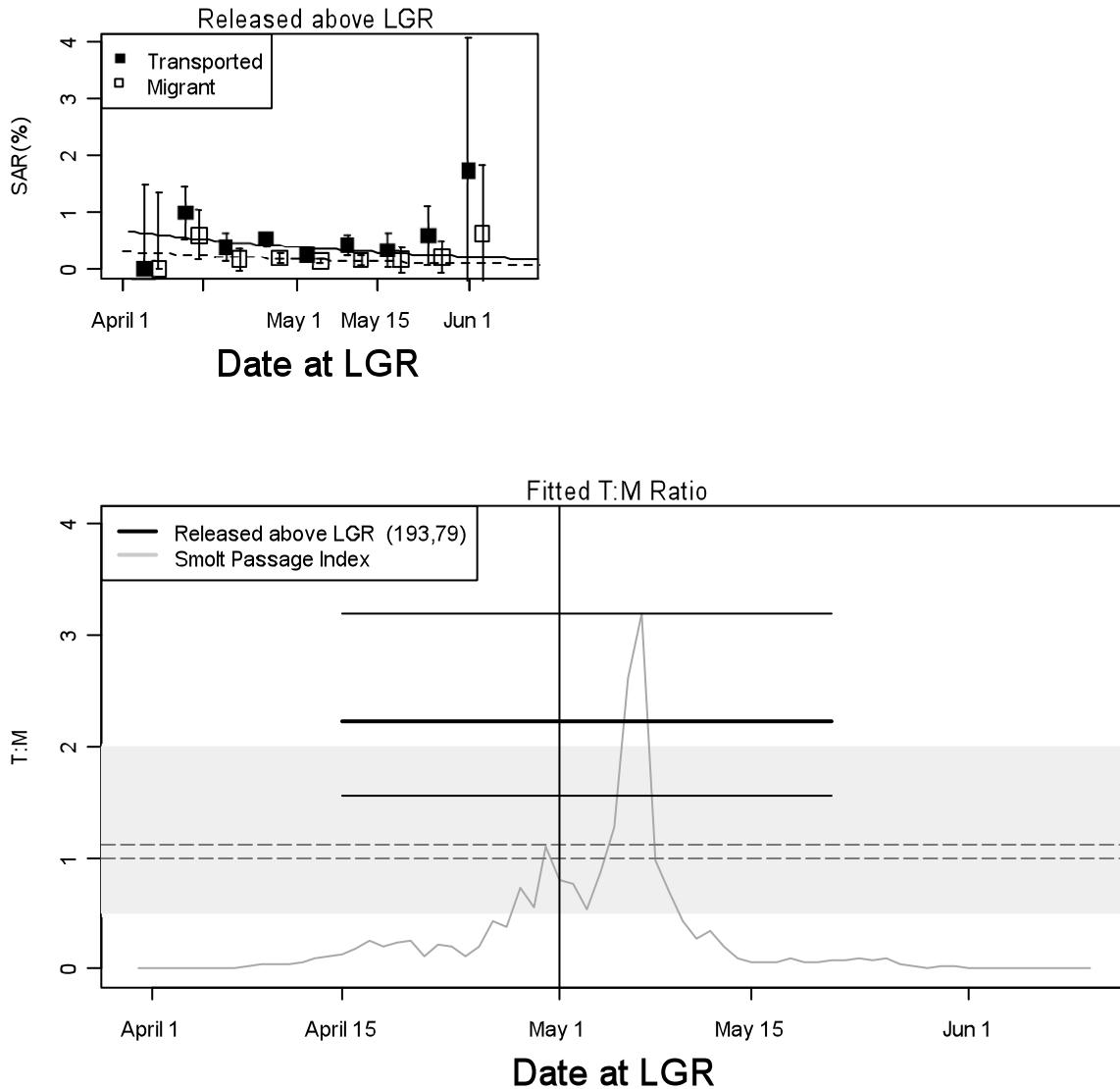
**Figure A16.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery spring/summer Chinook salmon from migration year 2002. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Chinook 2003



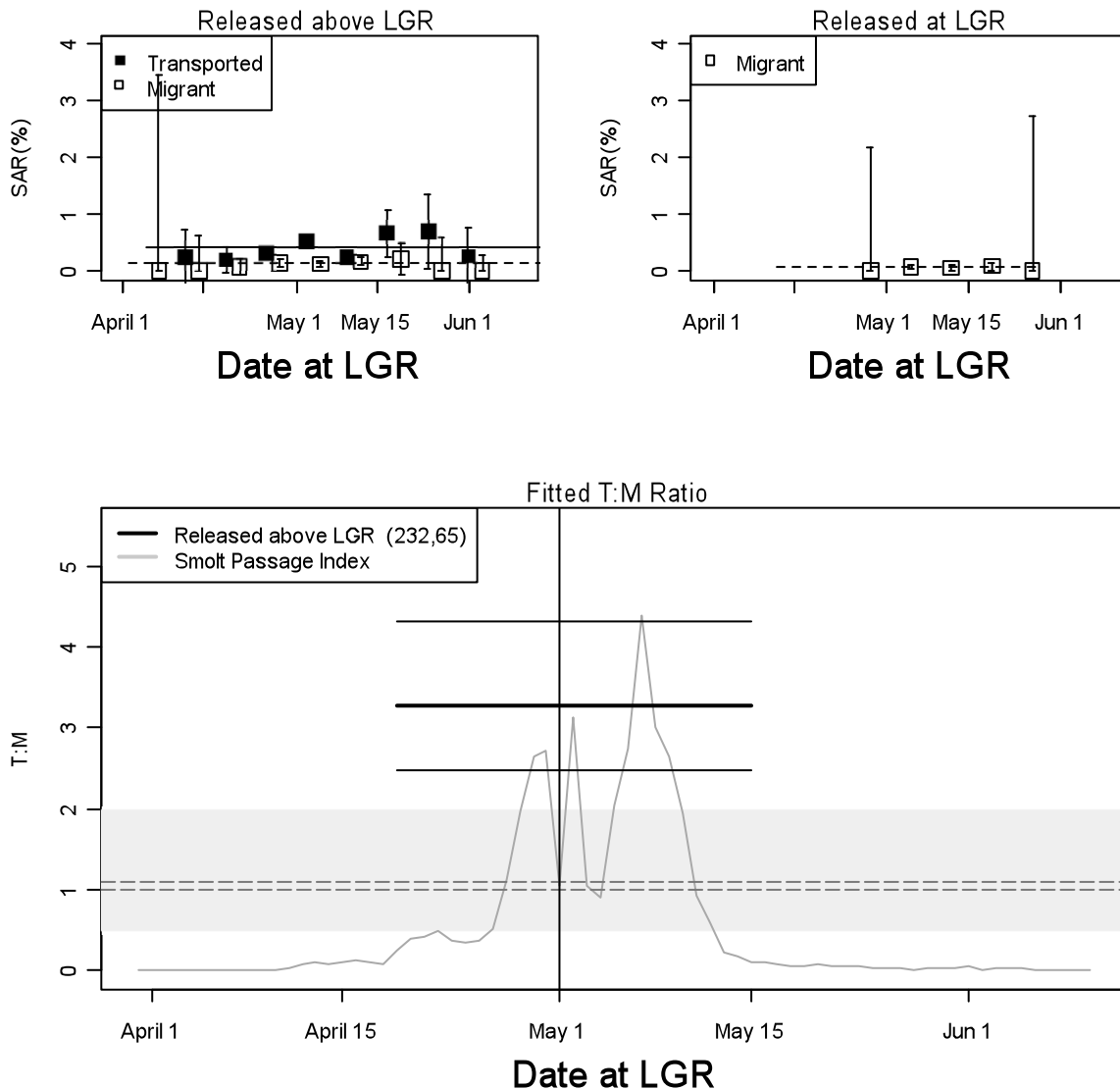
**Figure A17.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery spring/summer Chinook salmon from migration year 2003. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Chinook 2004



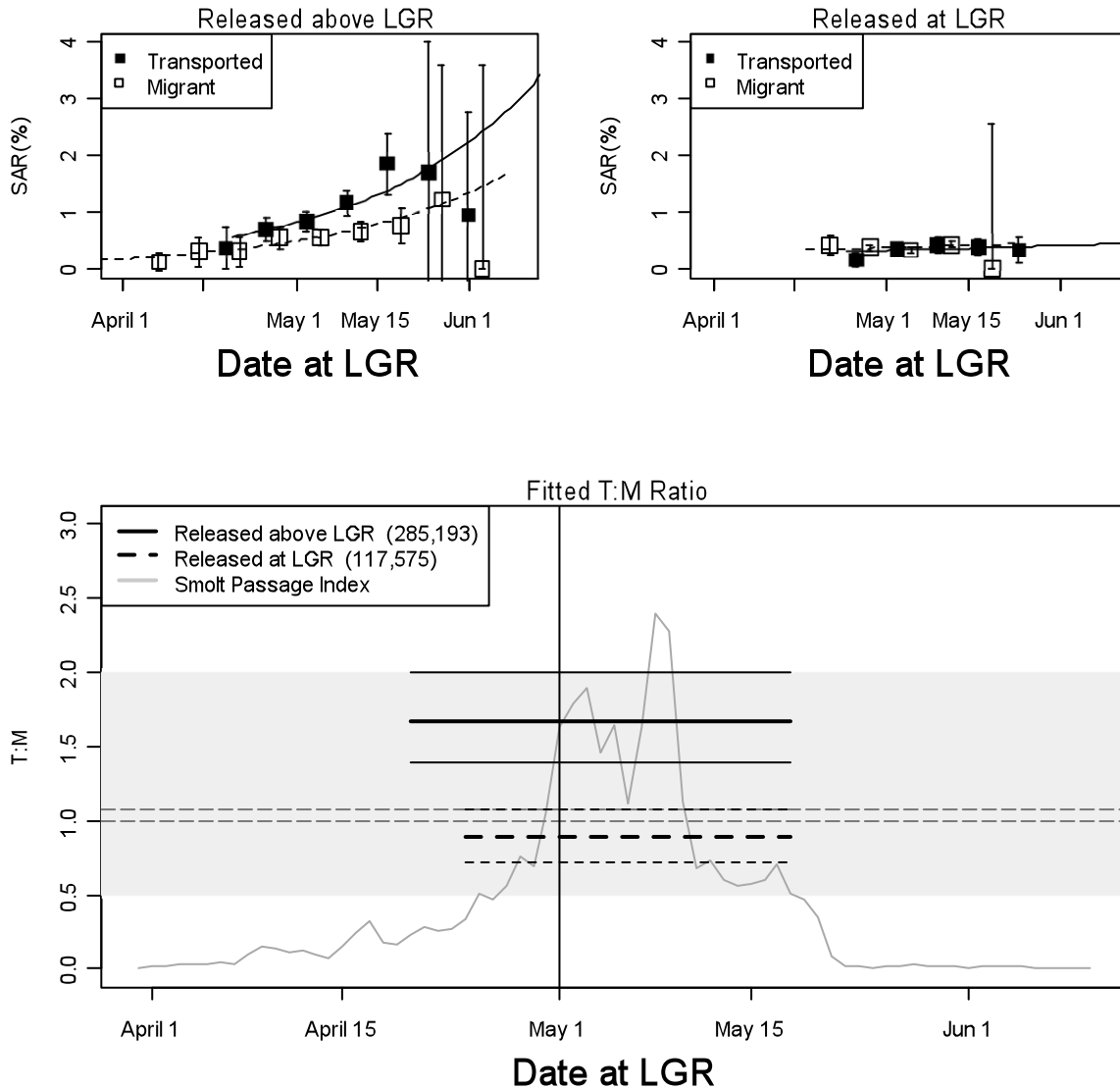
**Figure A18.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery spring/summer Chinook salmon from migration year 2004. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Chinook 2005



**Figure A19.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery spring/summer Chinook salmon from migration year 2005. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

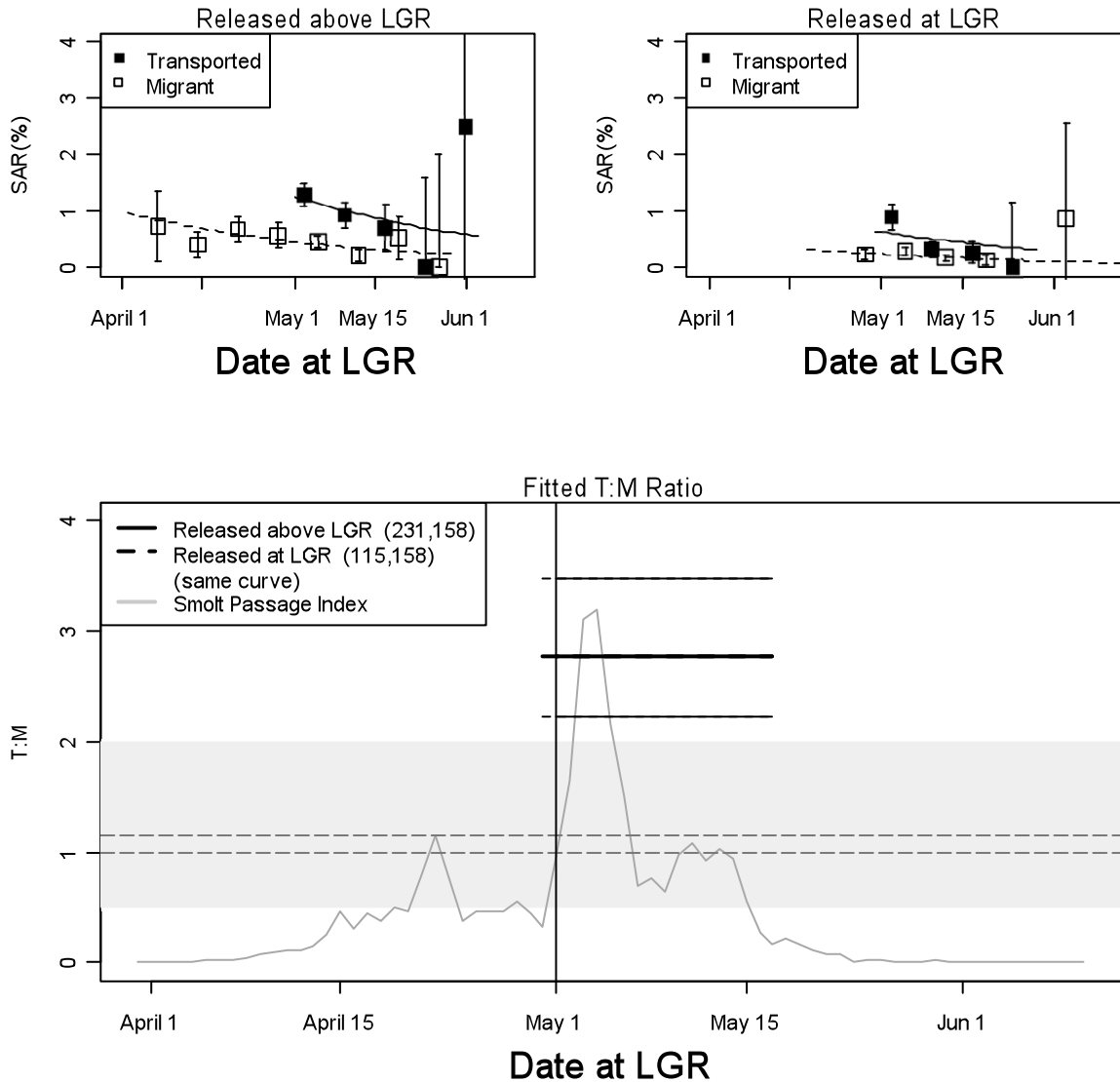
## Hatchery Chinook 2006



**Figure A20.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery spring/summer Chinook salmon from migration year 2006. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

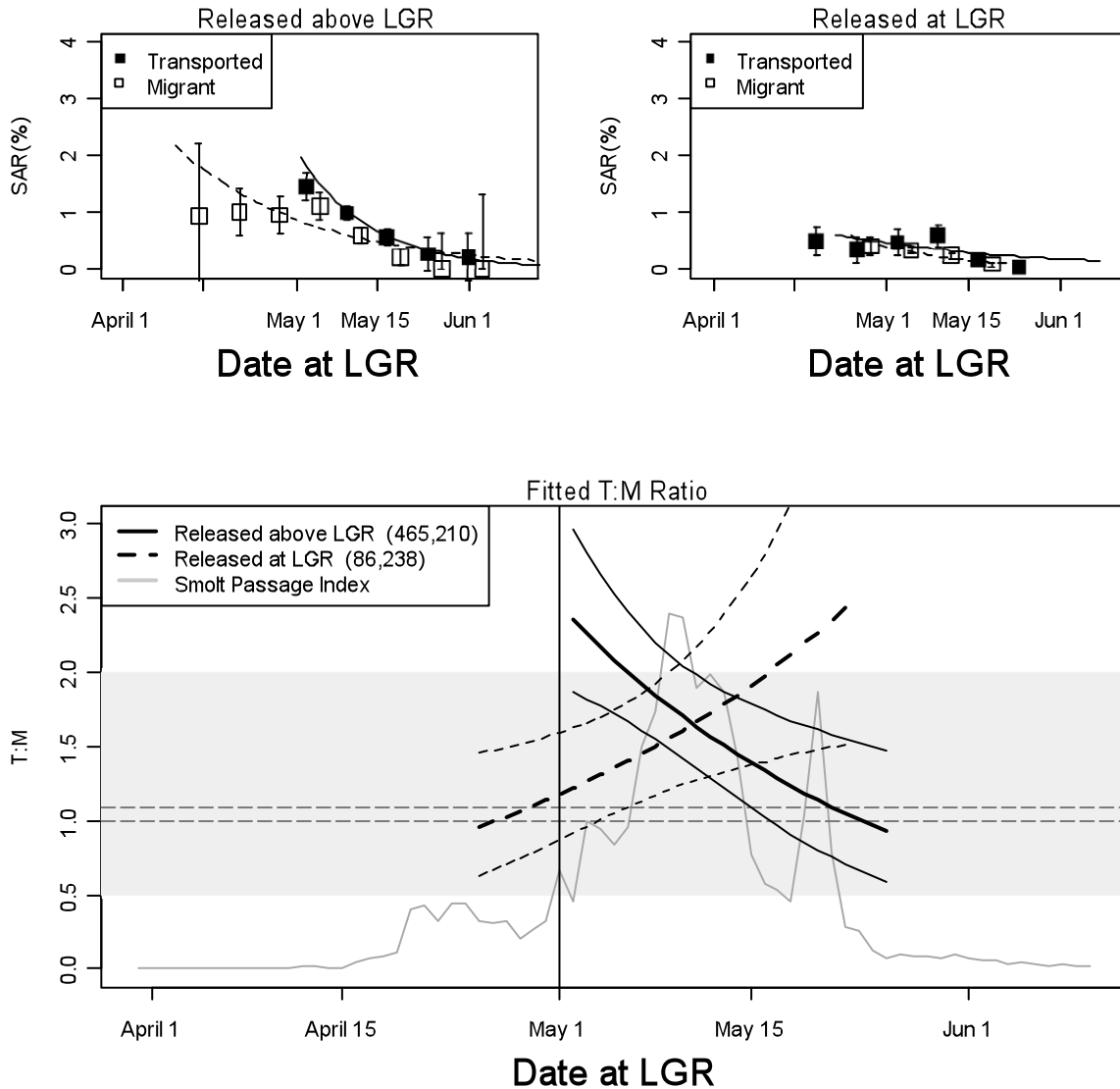


## Hatchery Chinook 2007



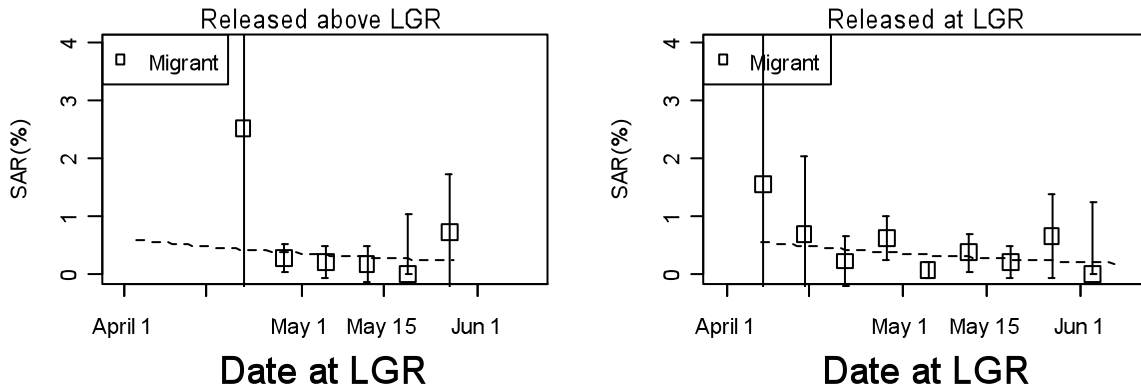
**Figure A21.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery spring/summer Chinook salmon from migration year 2007. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Chinook 2008



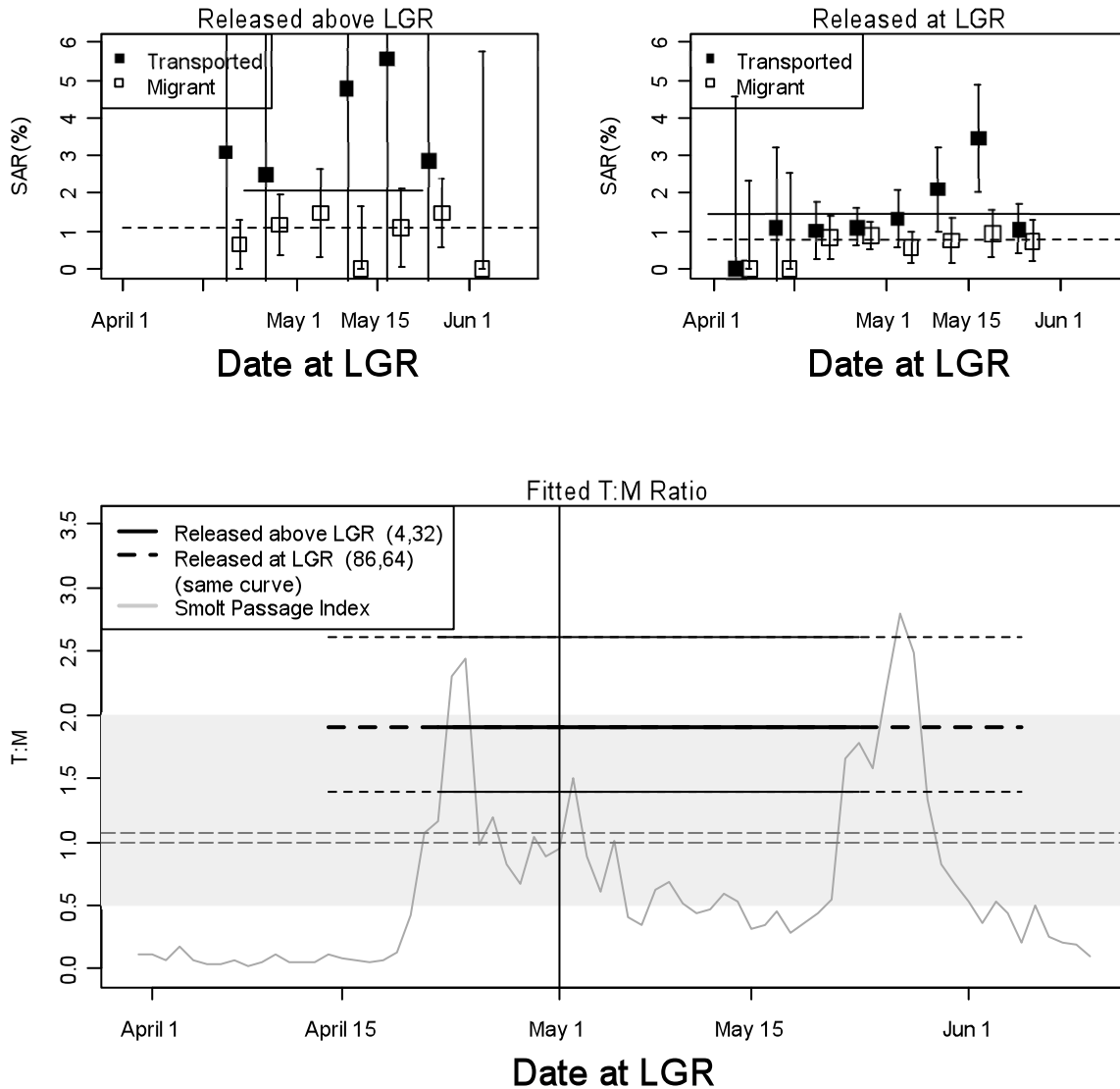
**Figure A22.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery spring/summer Chinook salmon from migration year 2008. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Steelhead 1998



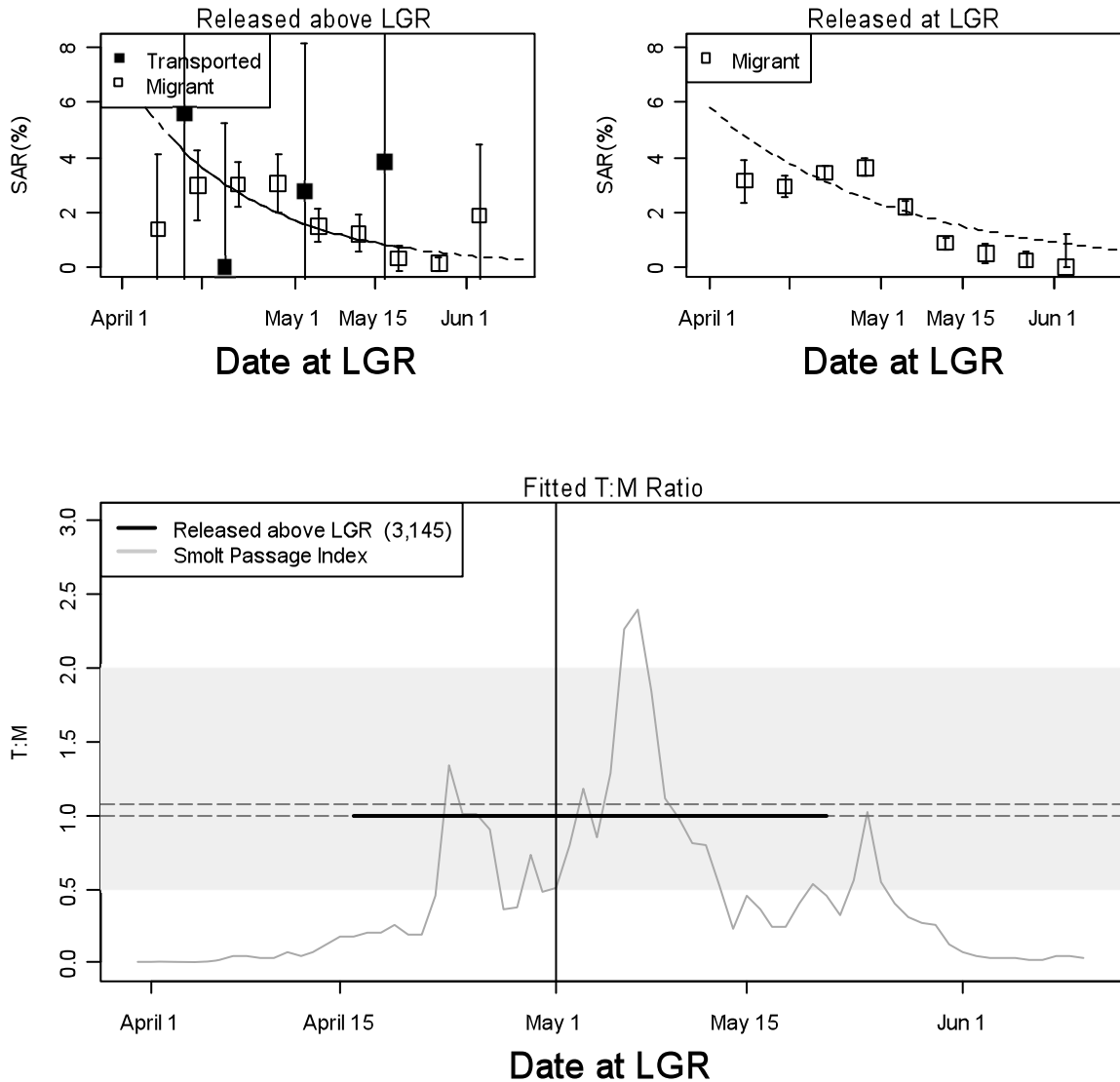
**Figure A23.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild steelhead from migration year 1998. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Steelhead 1999



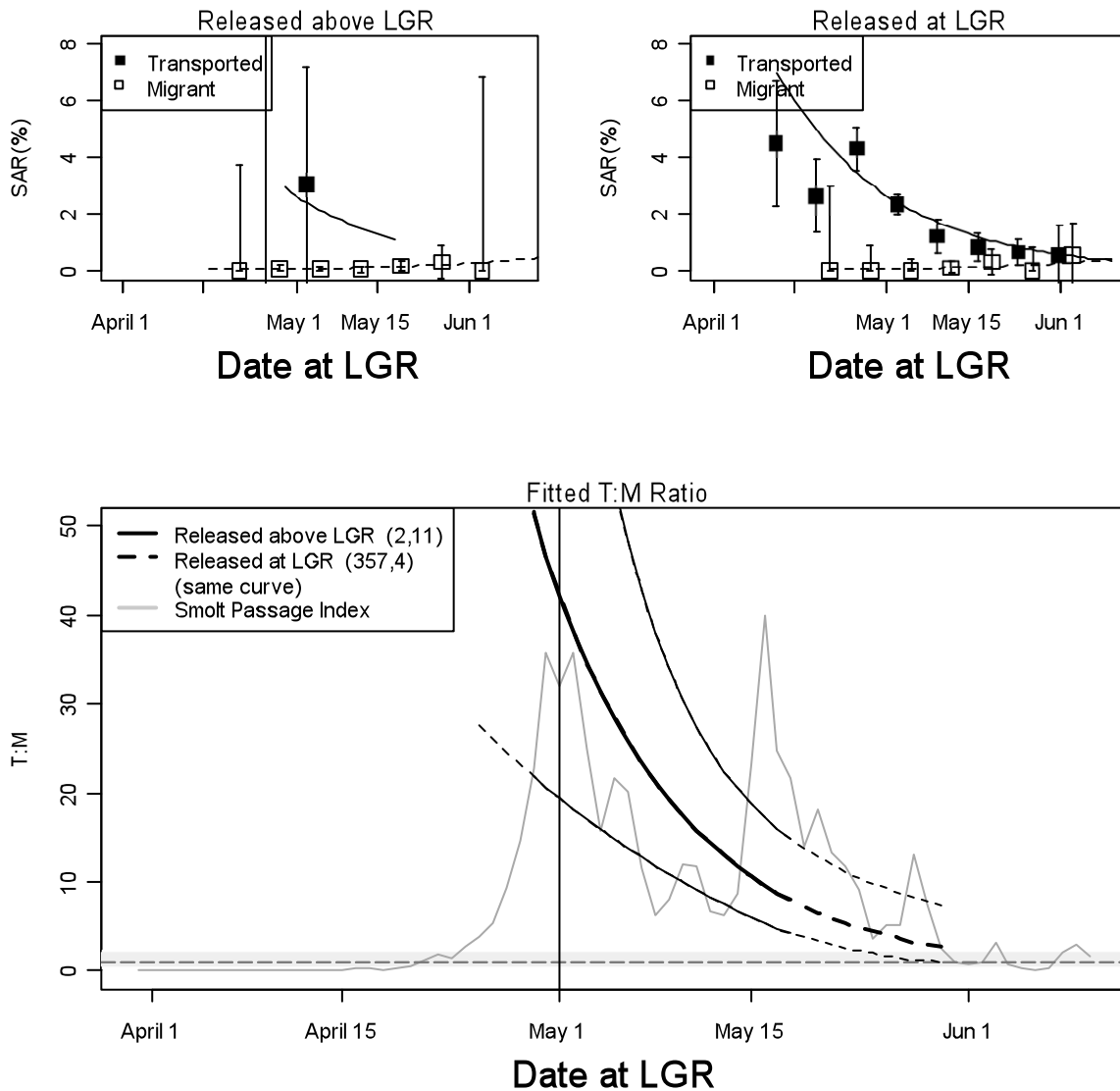
**Figure A24.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild steelhead from migration year 1999. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Steelhead 2000



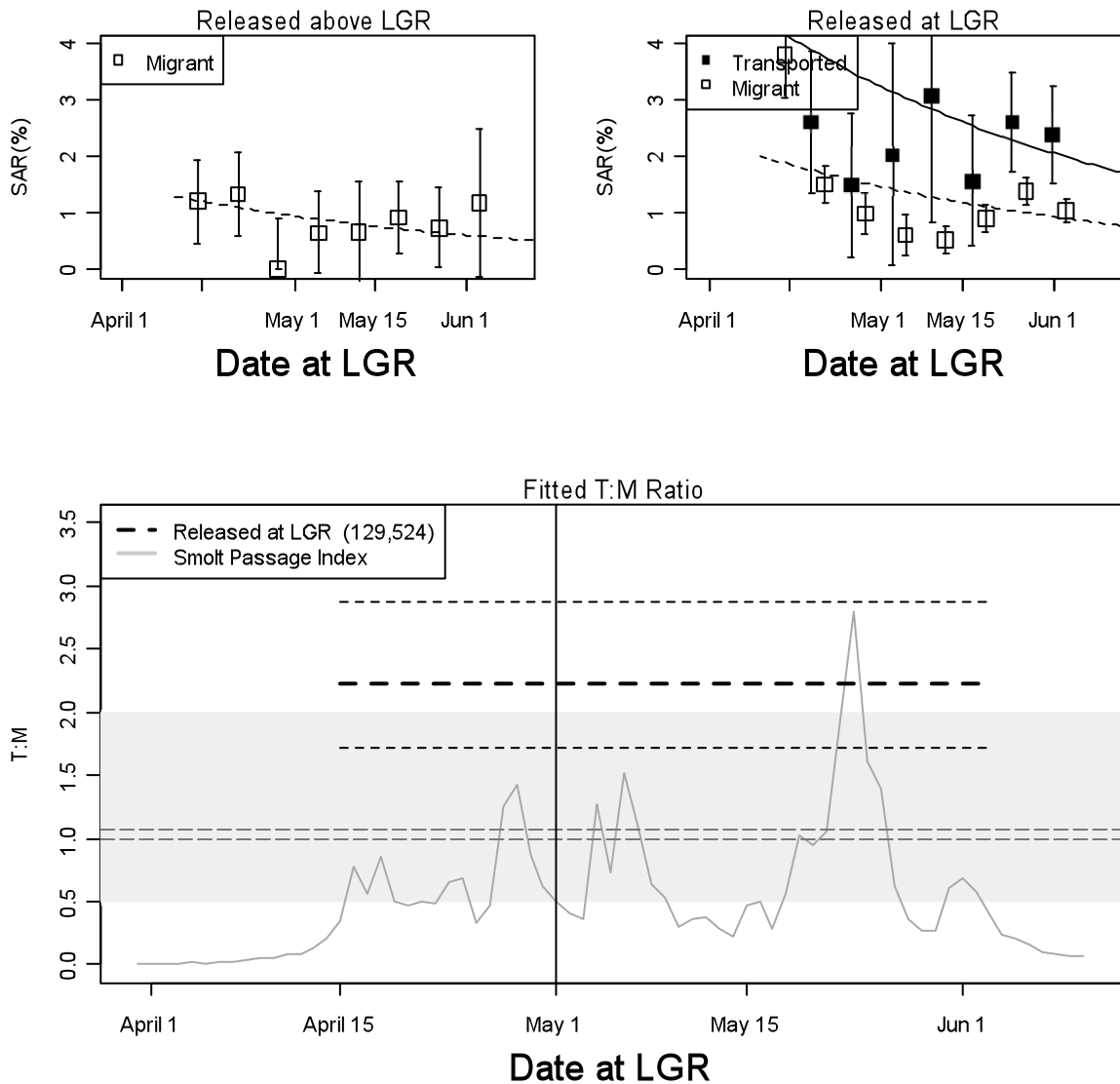
**Figure A25.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild steelhead from migration year 2000. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Steelhead 2001



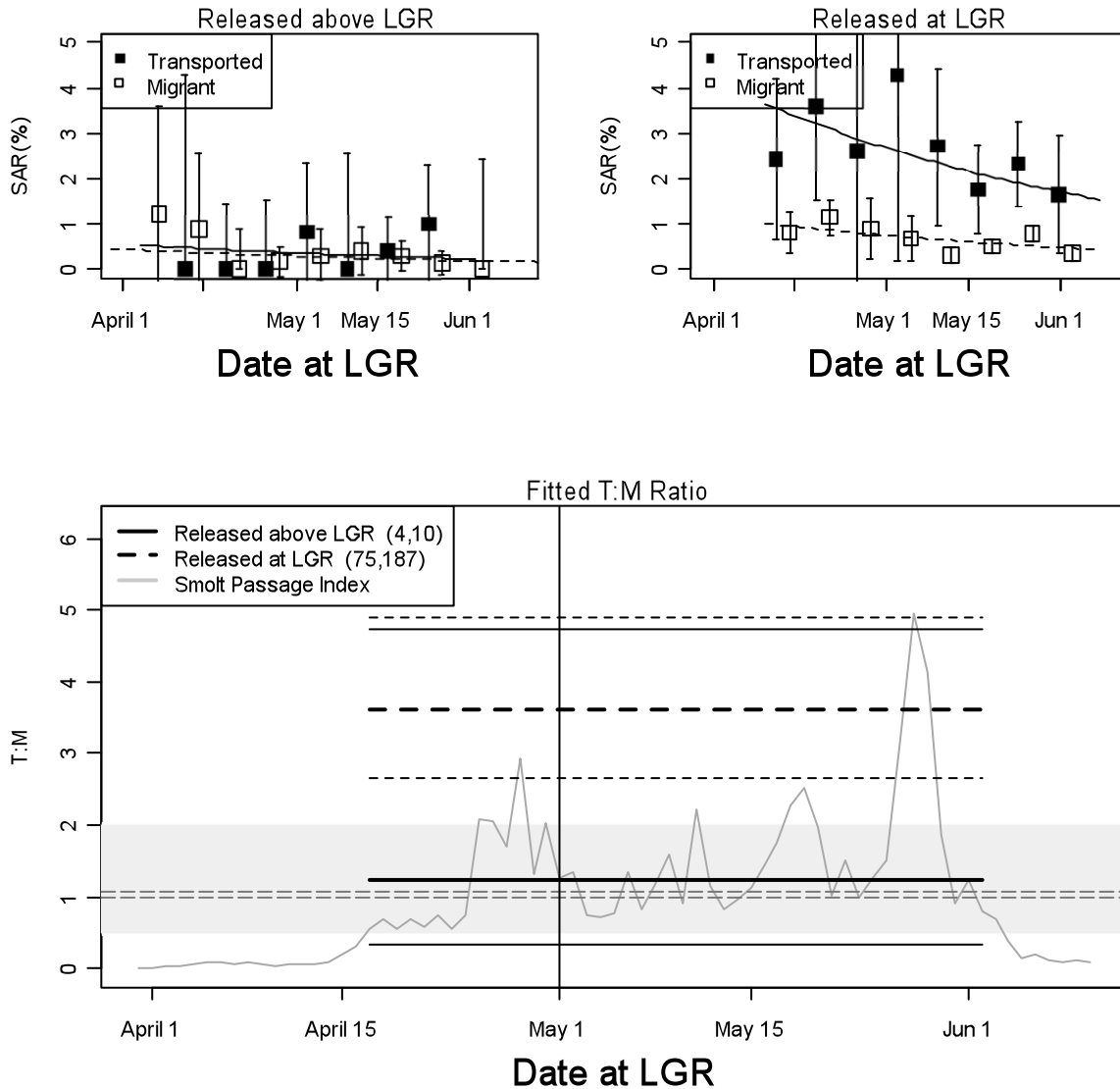
**Figure A26.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild steelhead from migration year 2001. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Steelhead 2002



**Figure A27.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild steelhead from migration year 2002. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

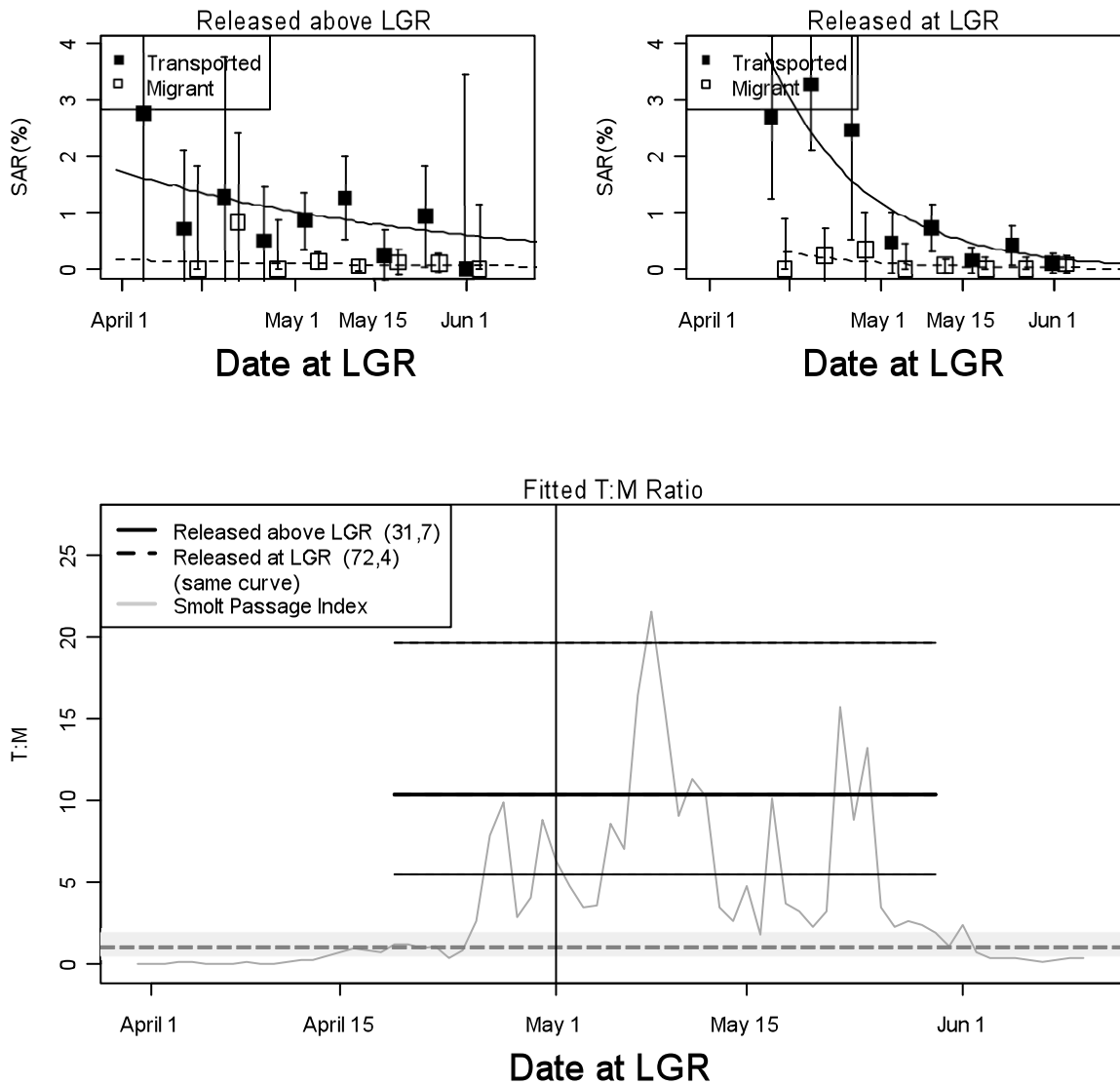
## Wild Steelhead 2003



**Figure A28.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild steelhead from migration year 2003. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

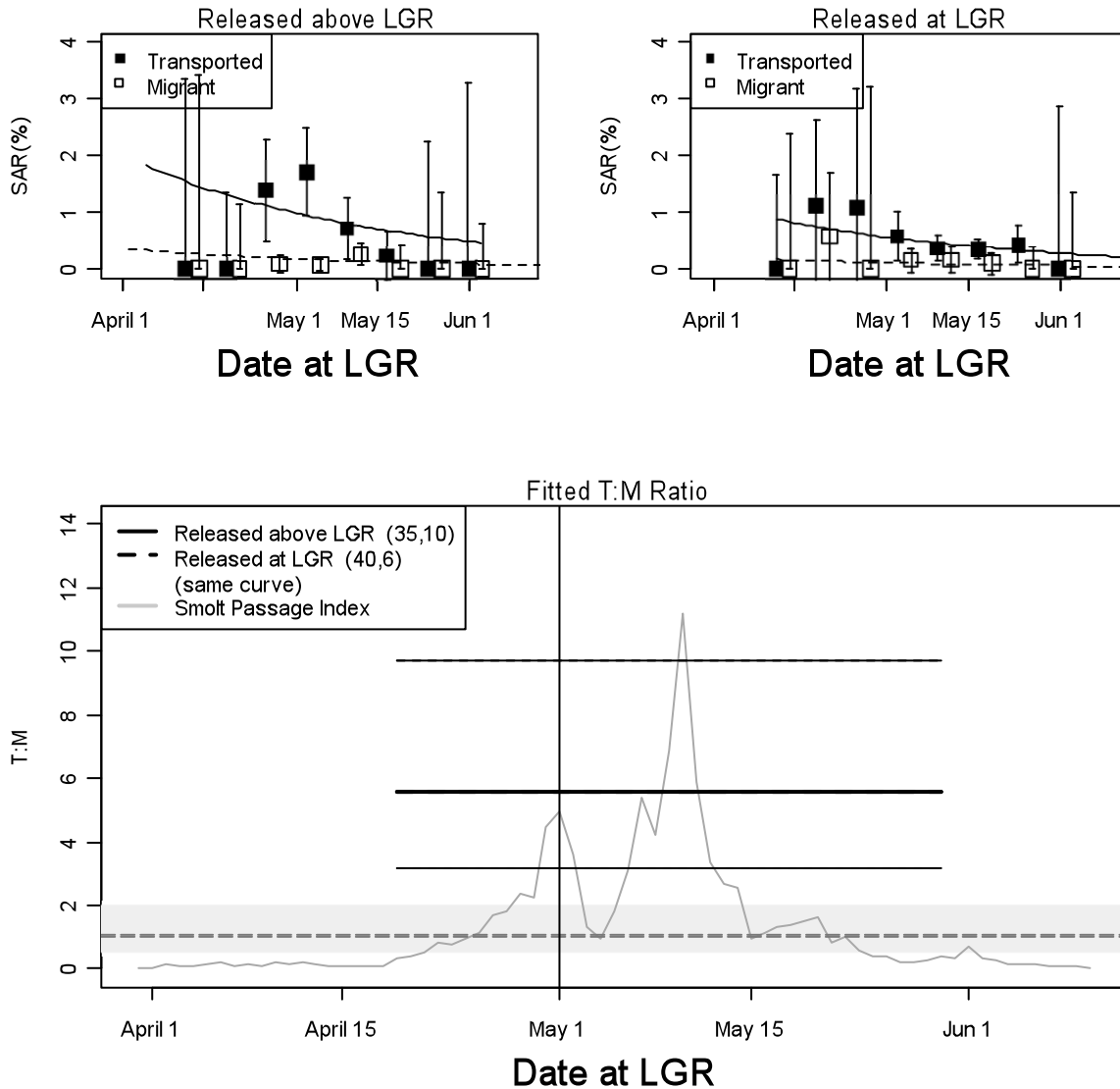


## Wild Steelhead 2004



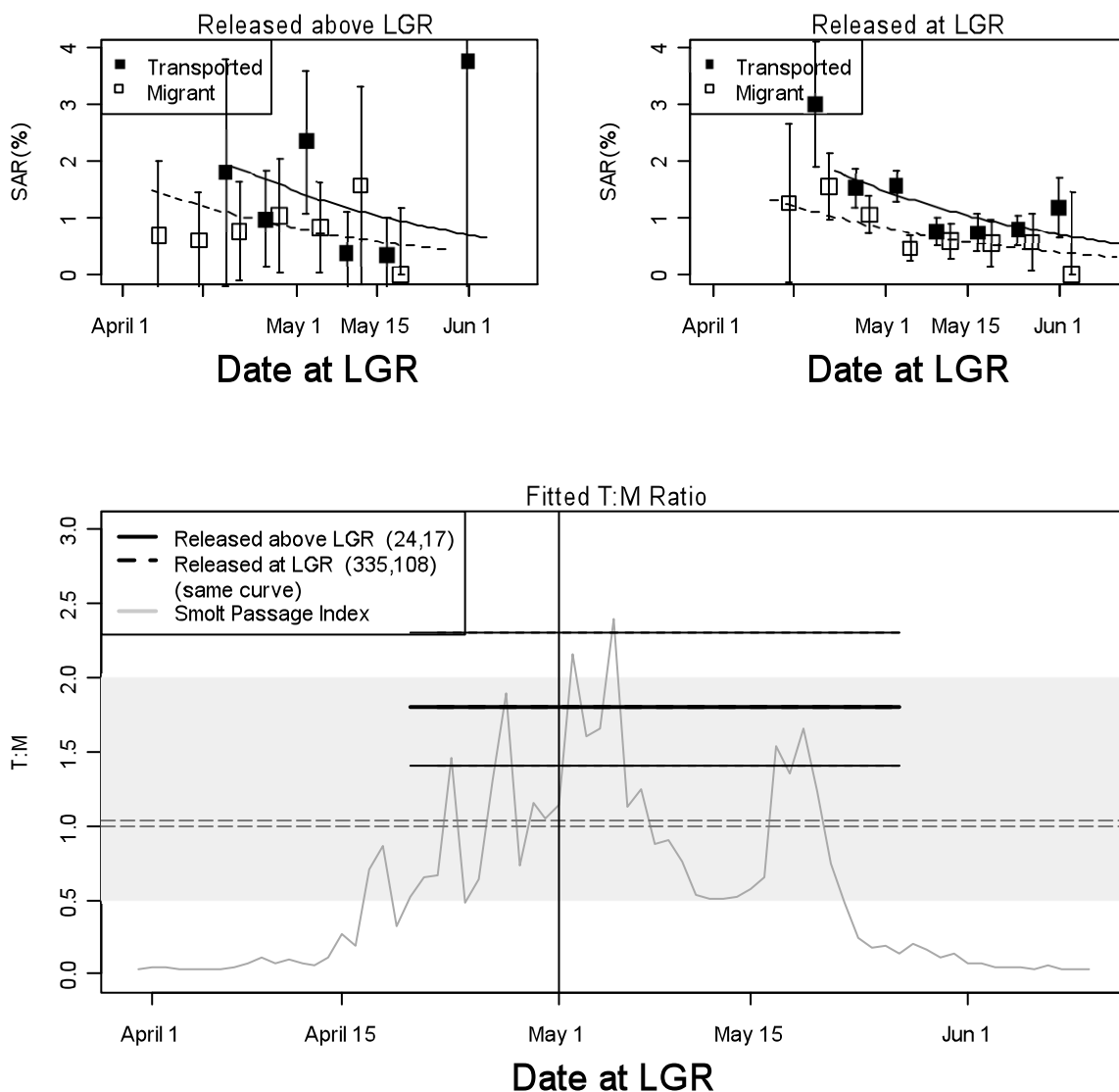
**Figure A29.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild steelhead from migration year 2004. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Steelhead 2005



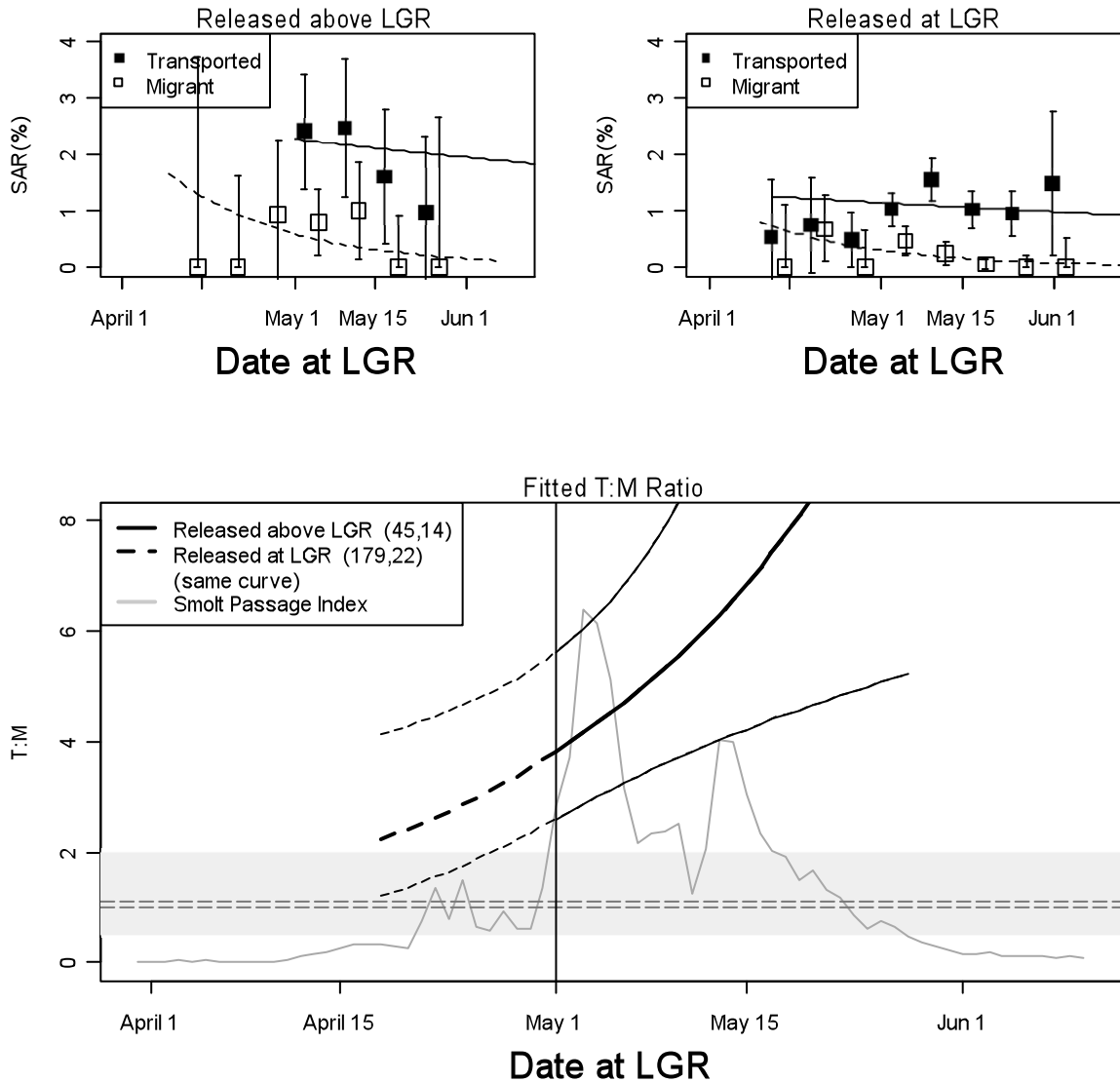
**Figure A30.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild steelhead from migration year 2005. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Steelhead 2006



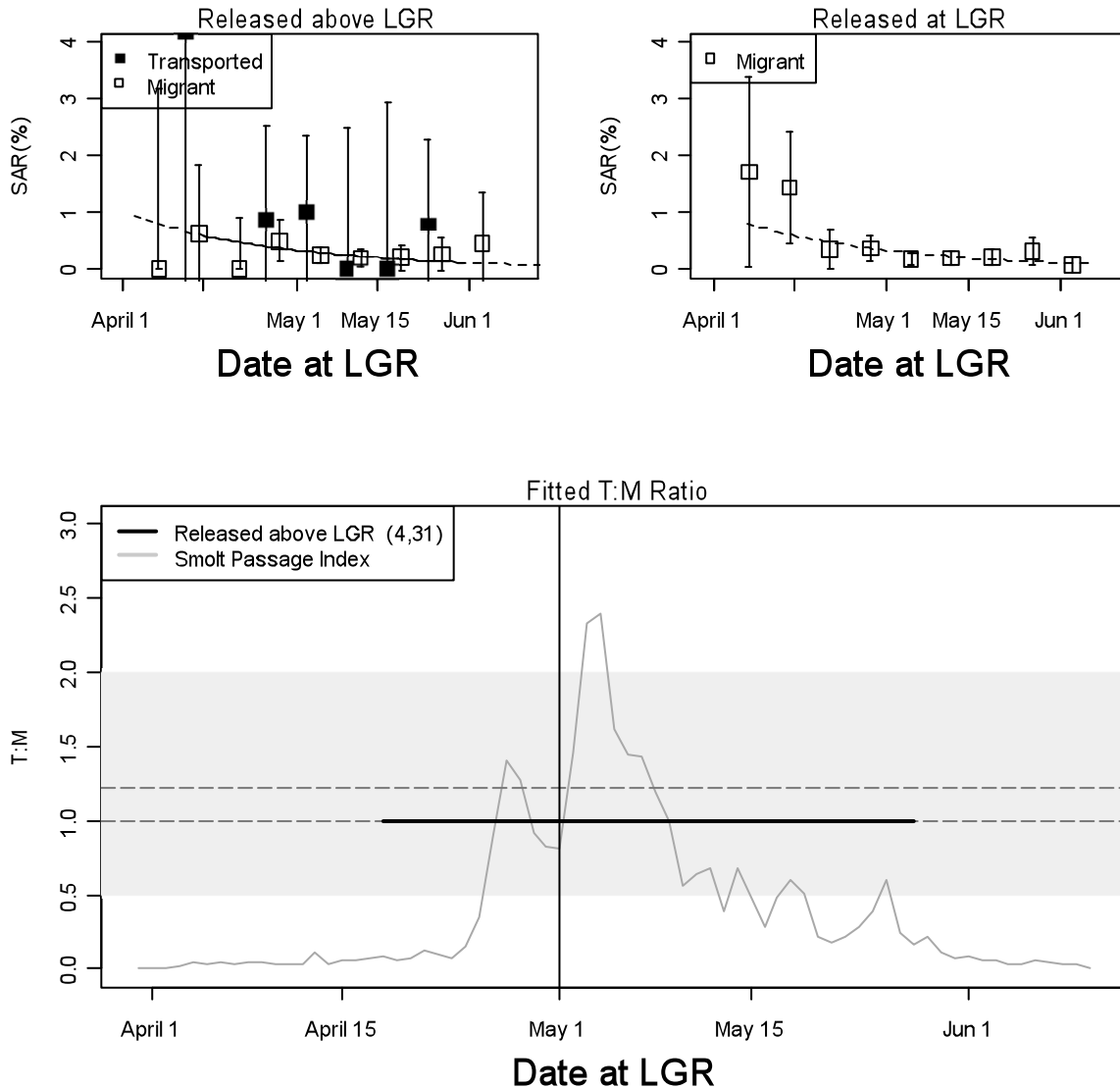
**Figure A31.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild steelhead from migration year 2006. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Wild Steelhead 2007



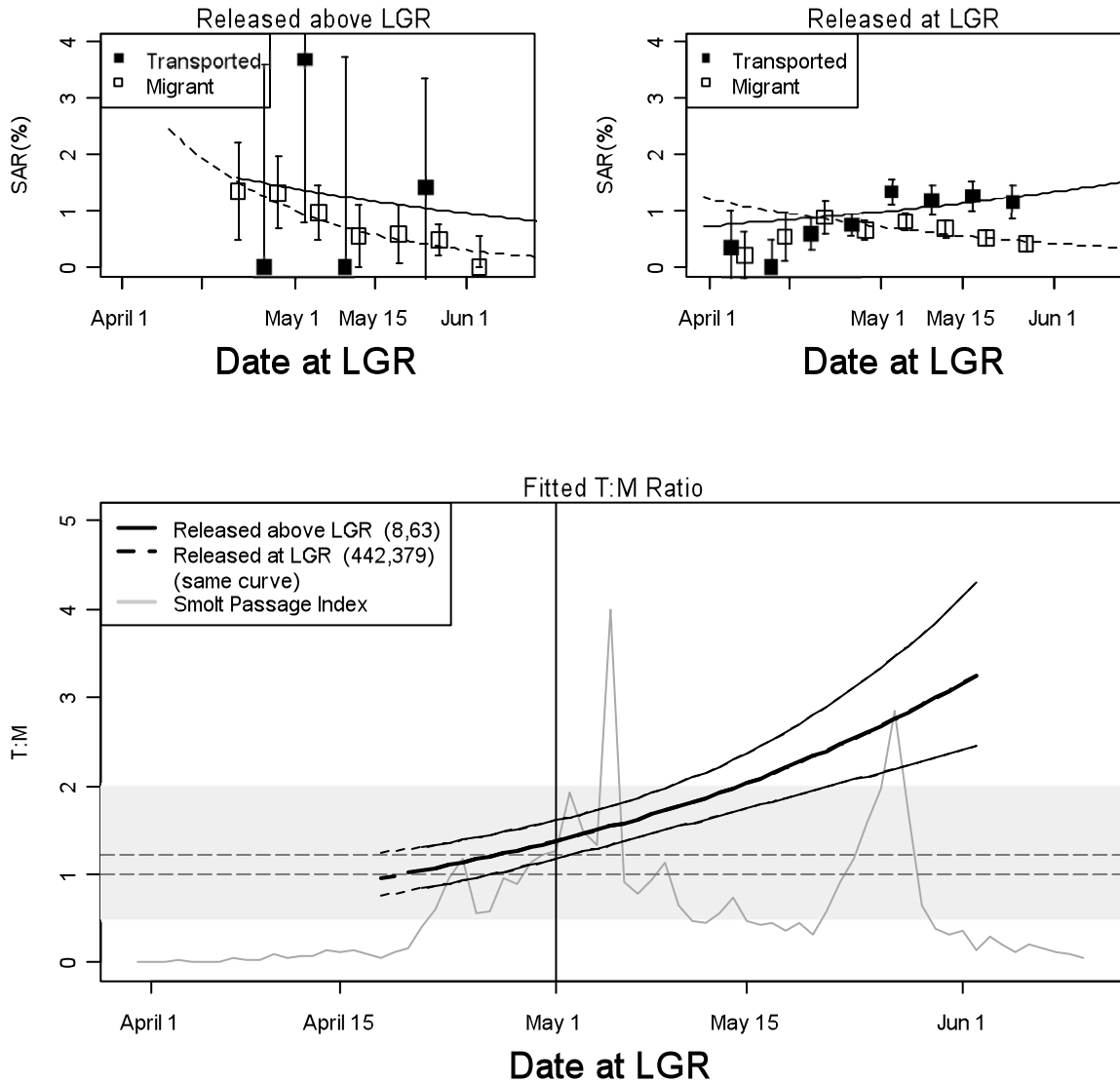
**Figure A32.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River wild steelhead from migration year 2007. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Steelhead 1998



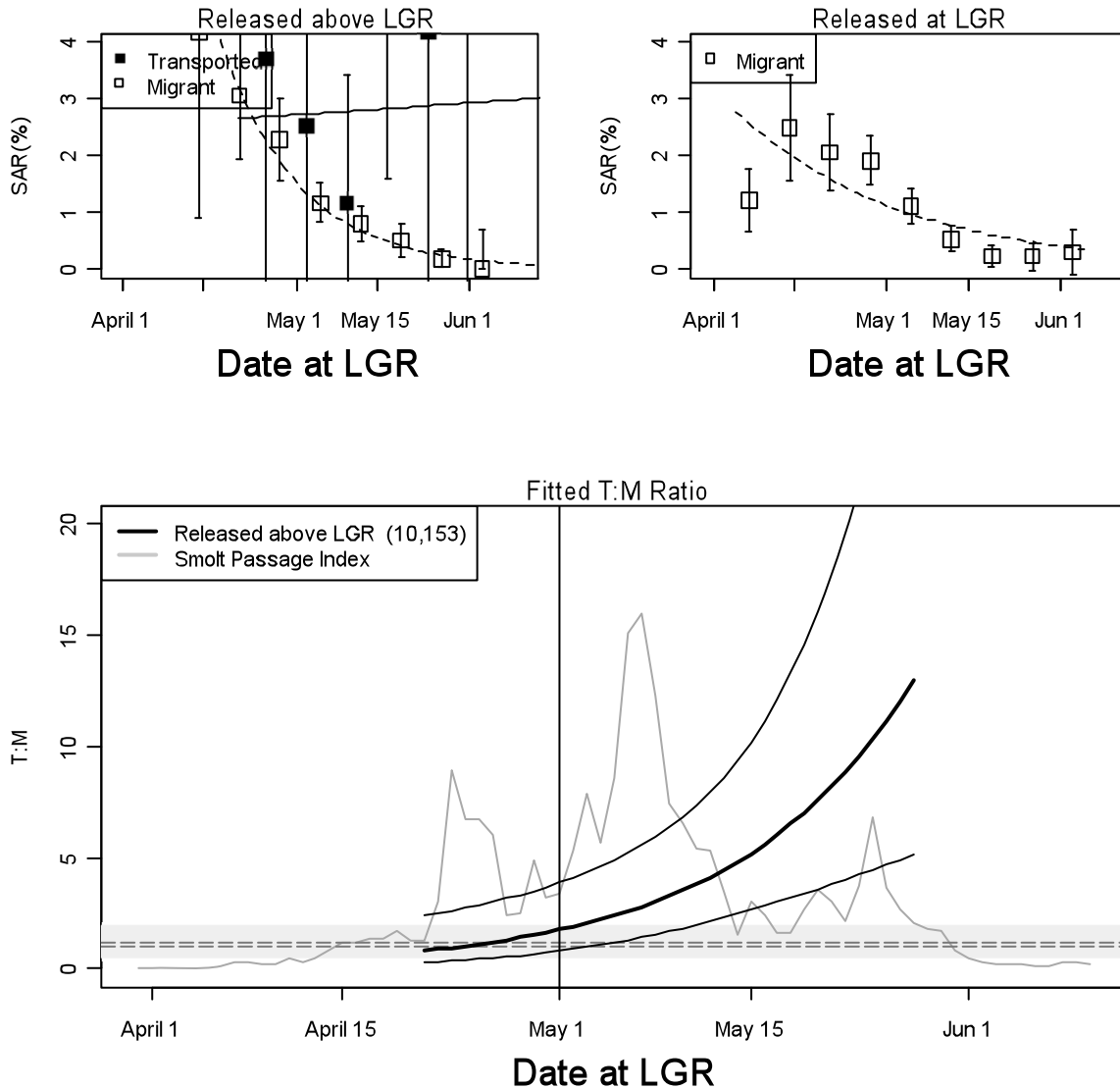
**Figure A33.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery steelhead from migration year 1998. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Steelhead 1999



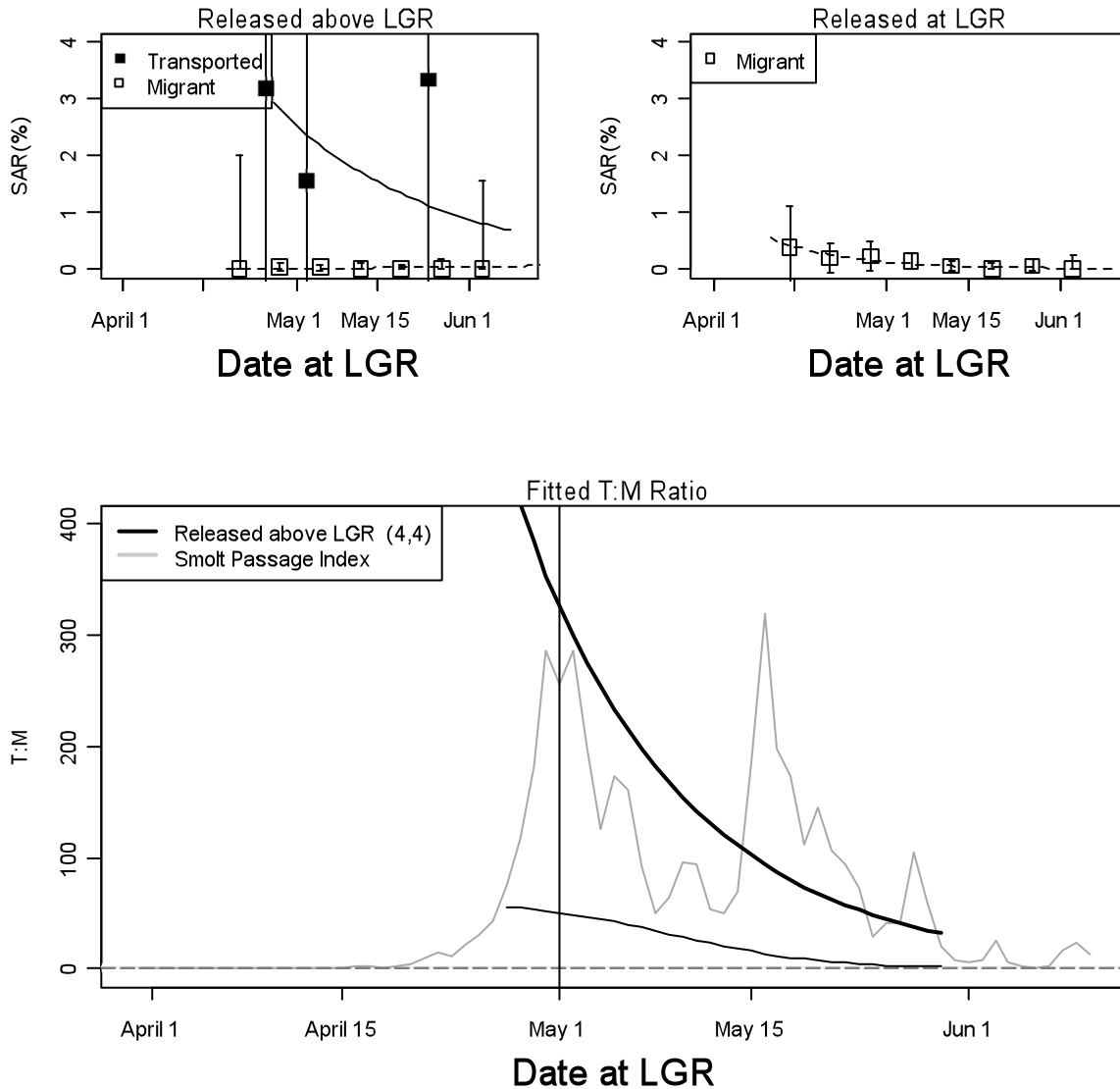
**Figure A34.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery steelhead from migration year 1999. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Steelhead 2000



**Figure A35.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery steelhead from migration year 2000. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

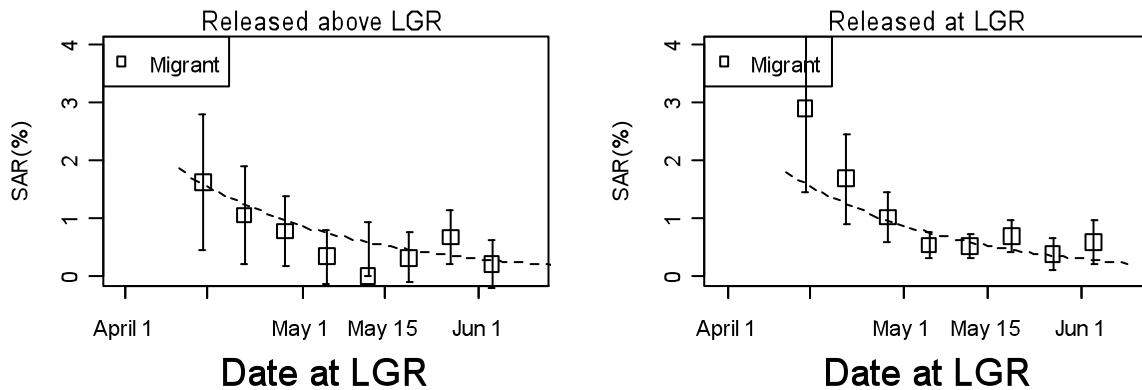
## Hatchery Steelhead 2001



**Figure A36.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery steelhead from migration year 2001. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

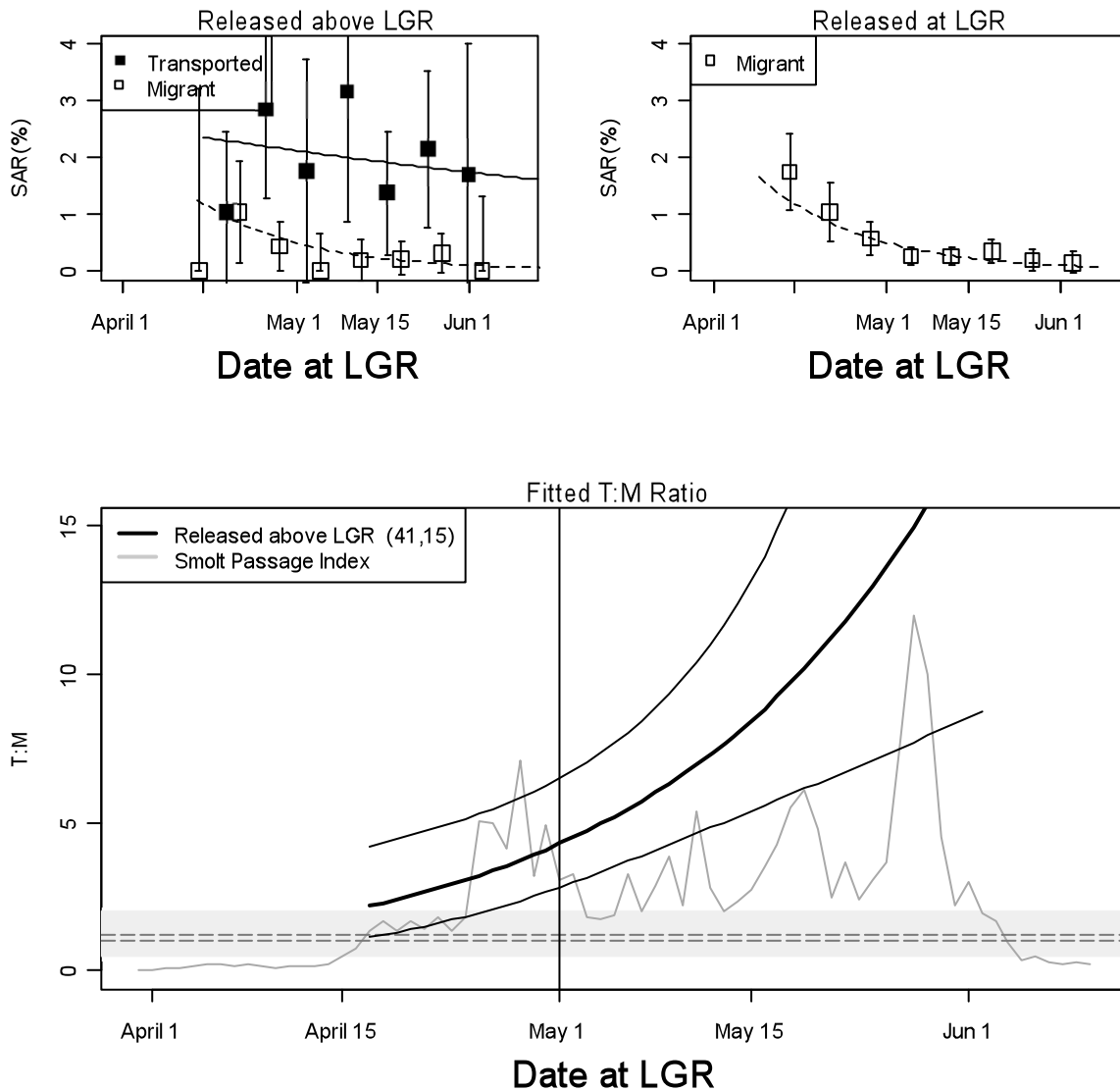


## Hatchery Steelhead 2002



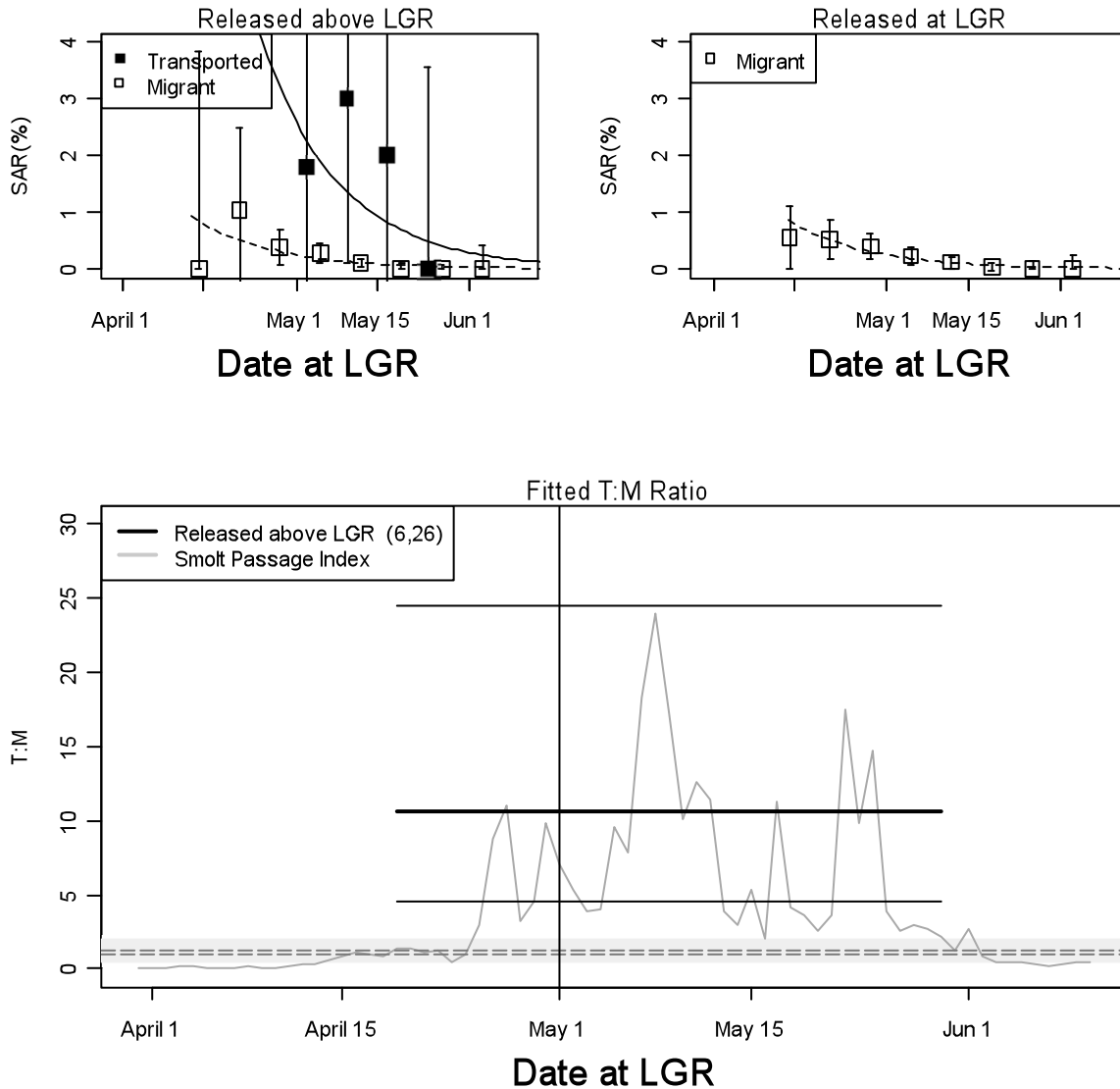
**Figure A37.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery steelhead from migration year 2002. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Steelhead 2003



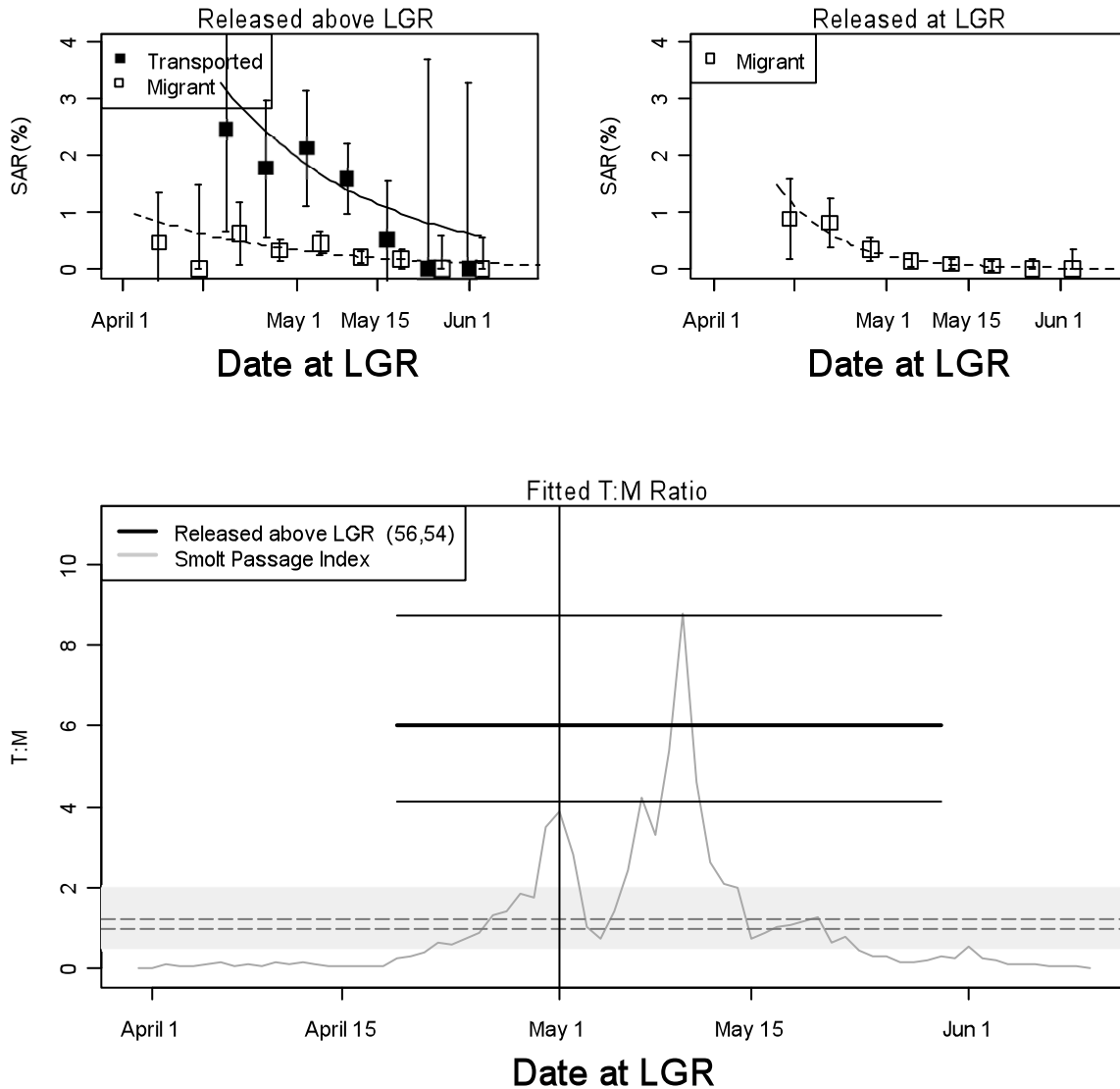
**Figure A38.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery steelhead from migration year 2003. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Steelhead 2004



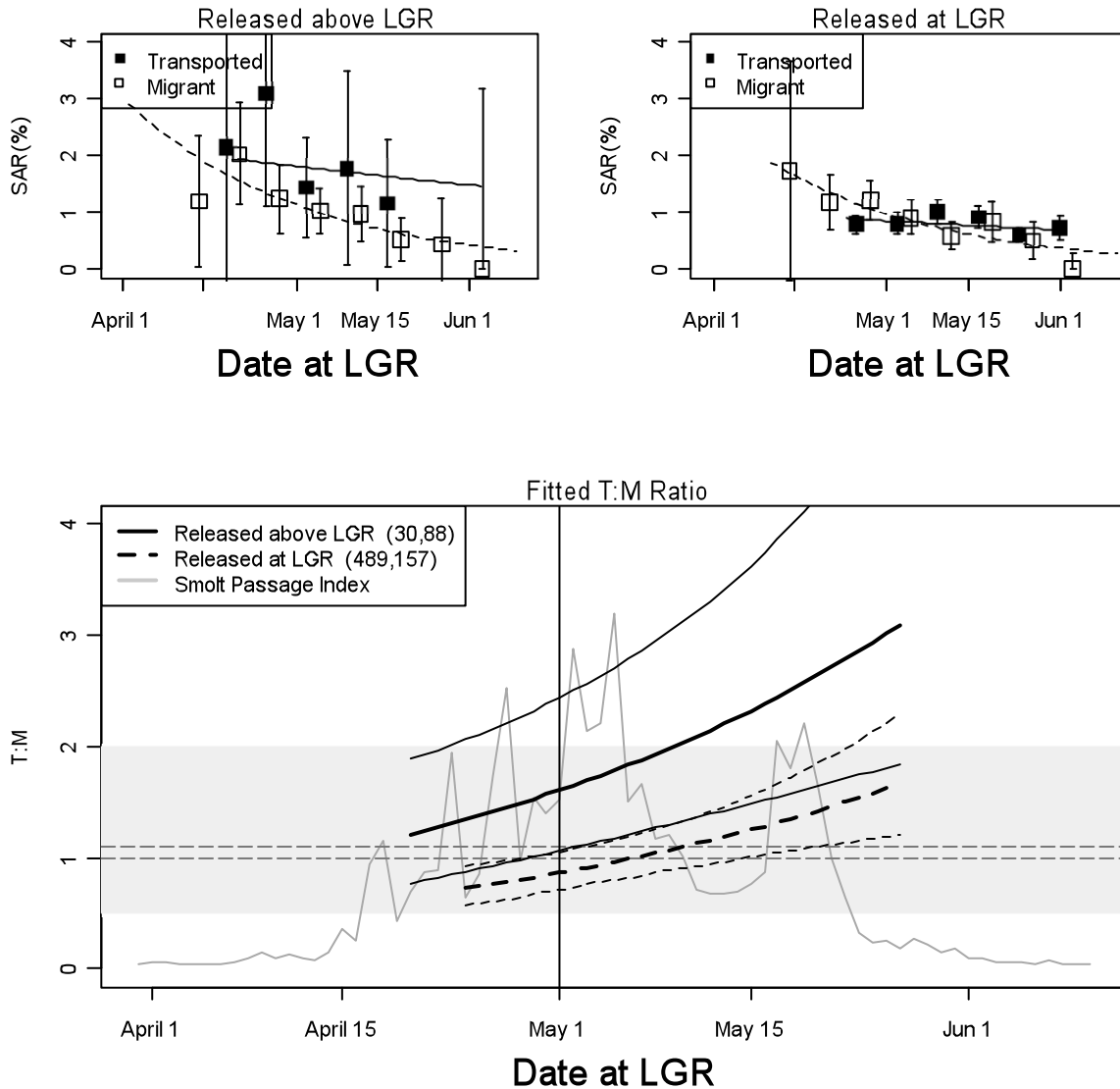
**Figure A39.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery steelhead from migration year 2004. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Steelhead 2005



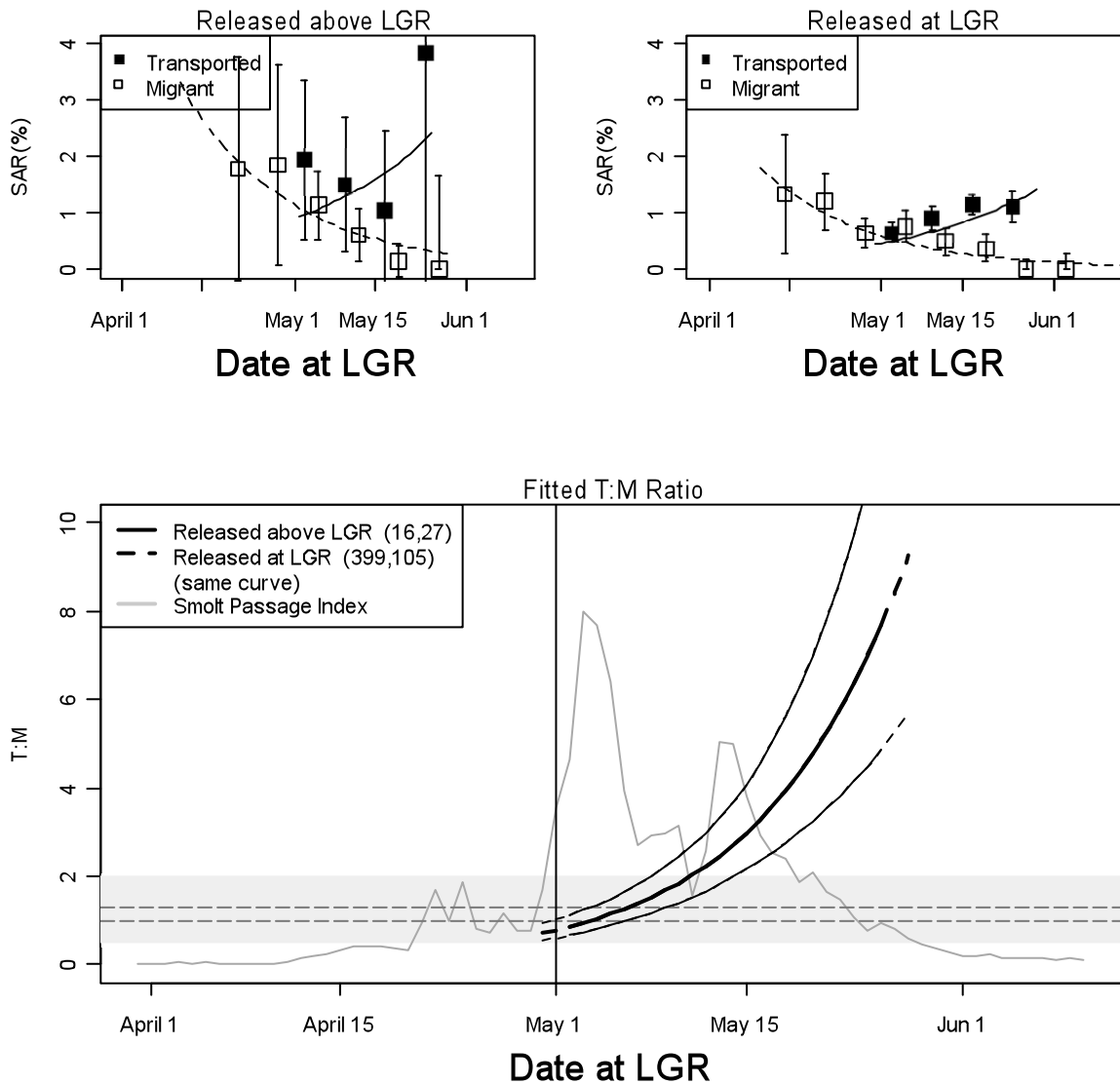
**Figure A40.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery steelhead from migration year 2005. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Steelhead 2006



**Figure A41.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery steelhead from migration year 2006. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.

## Hatchery Steelhead 2007



**Figure A42.** SAR (%) and Transport:Migrant (T:M) ratios versus date for Snake River hatchery steelhead from migration year 2007. Fish were tagged upstream from (“above”) or at Lower Granite Dam and either transported from Lower Granite or released in or directed to the tailrace after detection. SARs are measured from outmigration at Lower Granite to adult return to Lower Granite. Plots of SARs include points for weekly cohorts with vertical bars representing 95% confidence intervals, and lines representing predicted SAR for transport (solid) and migrant (dashed) groups. In the T:M plot, the heavier curves represent the predicted relationship of T:M versus date, the lighter curves represent the 95% confidence envelope around the curve. Horizontal dashed lines represent either 1.0 or the adjusted comparison line (see text for details). Legend of the T:M plot includes numbers of adult fish (in parentheses) in the transport and migrant groups, respectively. Smolt Passage Index in the T:M plot represents relative abundance across the season.