

Wild sp/su chinook salmon marking above Lower Granite Dam

Year	Trans. SAR	No. of adults	In-river SAR	N.D.	No. of adults	T/I	(95%) conf.
1995	0.30	8	0.34	9%	10	0.89	(0.34-2.30)
1996	0.56	2	0.21	24%	5	2.52	(0.47-13.50)
1997	2.10	4	1.82	27%	17	1.16	(0.38-3.56)
1998	1.14	15	1.48	12%	48	0.77	(0.42-1.39)
1999	2.21	48	2.01	10%	104	1.10	(0.77-1.56)
2000	0.50	4	0.91	21%	73	0.55	(0.20-1.54)
Geometric mean (1995-00)						1.03	(0.68-1.57)



Wild sp/su chinook salmon marking at Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	0.38	195	0.23	26	1.68	(1.11-2.55)
1996	0.11	9	0.06	3	1.98	(0.52-7.52)
1997	-----	--	-----	---	-----	-----
1998	0.60	34	0.95	28	0.63	(0.37-1.04)
1999	2.10	192	1.35	26	1.55	(1.02-2.36)
2000	0.71	127	0.61	161	1.17	(0.92-1.48)
Geometric mean (1995-00)					1.30	(0.87-1.95)



Hatchery sp/su chinook salmon marking above Lower Granite Dam

Year	Trans. SAR	No. of adults	In-river SAR	N.D.	No. of adults	T/I	(95%) conf.
1995	0.60	20	0.35	14%	32	1.71	(0.97-3.03)
1996	0.16	6	0.16	24%	32	0.95	(0.39-2.32)
1997	0.78	233	0.65	24%	185	1.21	(1.00-1.48)
1998	1.30	885	1.15	13%	336	1.13	(1.00-1.29)
1999	2.54	1,203	1.68	17%	736	1.51	(1.37-1.66)
2000	1.93	1,021	1.08	30%	621	1.79	(1.61-1.98)
Geometric mean (1995-00)						1.35	(1.10-1.65)



Hatchery sp/su chinook salmon marking at Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	0.54	471	0.32	123	1.68	(1.37-2.06)
1996	0.13	47	0.10	26	1.24	(0.76-2.02)
1997	-----	---	-----	---	-----	-----
1998	0.62	253	0.57	134	1.09	(0.88-1.35)
1999	1.97	895	1.45	242	1.36	(1.17-1.57)
2000	-----	---	-----	---	-----	-----
Geometric mean (1995-00)					1.33	(1.10-1.59)



Wild steelhead marking above Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	0.46	1	0.24	1	1.87	(0.11-31.76)
1996	1.46	2	0.67	5	2.05	(0.38-11.03)
1997	0.82	3	0.76	4	1.08	(0.23-5.01)
1998	0.23	1	1.02	9	0.22	(0.03-1.85)
1999	3.24	12	1.95	23	1.66	(0.81-3.42)
2000	2.67	12	1.93	46	1.38	(0.72-2.66)
Geometric mean (1995-00)					1.13	(0.58-2.23)



Wild steelhead marking at Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	--	--	--	--	--	--
1996	--	--	--	--	--	--
1997	--	--	--	--	--	--
1998	0.48	4	0.37	7	1.30	(0.37-4.57)
1999	1.42	96	0.54	8	2.61	(1.25-5.47)
2000	2.24	610	1.19	281	1.87	(1.62-2.17)
Geometric mean (1998-00)					1.85	(1.24-2.77)



Hatchery steelhead marking above Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	0.76	19	0.91	14	0.83	(0.41-1.69)
1996	0.23	4	0.37	17	0.62	(0.20-1.88)
1997	0.35	10	0.18	8	1.94	(0.75-5.03)
1998	0.53	7	0.86	26	0.61	(0.26-1.44)
1999	0.89	12	1.28	41	0.70	(0.36-1.34)
2000	2.22	14	0.88	41	2.53	(1.36-4.73)
Geometric mean (1995-00)					1.01	(0.61-1.69)



Hatchery steelhead marking at Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	--	--	--	--	--	--
1996	--	--	--	--	--	--
1997	0.65	2	0.20	11	3.28	(0.70-15.32)
1998	0.53	9	0.41	24	1.29	(0.59-2.82)
1999	1.07	477	0.79	82	1.36	(1.07-1.74)
2000	1.08	12	0.66	61	1.65	(0.87-3.11)
Geometric mean (1995-00)					1.43	(1.23-1.66)



D = differential survival of transported fish compared to non-transported fish downstream from Bonneville Dam

“Differential” from what is expected

If transported juveniles have a 100% (1.0) survival to below Bonneville Dam, and non-transported fish have a 50% (0.5) survival through the hydropower system, then with equal survival below Bonneville Dam, we would see twice as many adult returns from transported fish (if we started with the same number of juveniles at the top of the system.)



$$D = \frac{\text{Return rate of transported fish}}{\text{Return rate of non-transported fish}} \times \text{survival rate of non-transported juveniles through hydropower system}$$

Perfect world example:

Transport return rate = 3.0%

Non-transport return rate = 1.5%

Juvenile hydropower system
survival = 0.50

$$D = 3/1.5 * 0.5 = 1$$

More likely example:

Transport return rate = 2.1%

Non-transport return rate = 1.6%

Juvenile hydropower system
survival = 0.45

$$D = 2.1/1.6 * 0.45 = 0.59$$



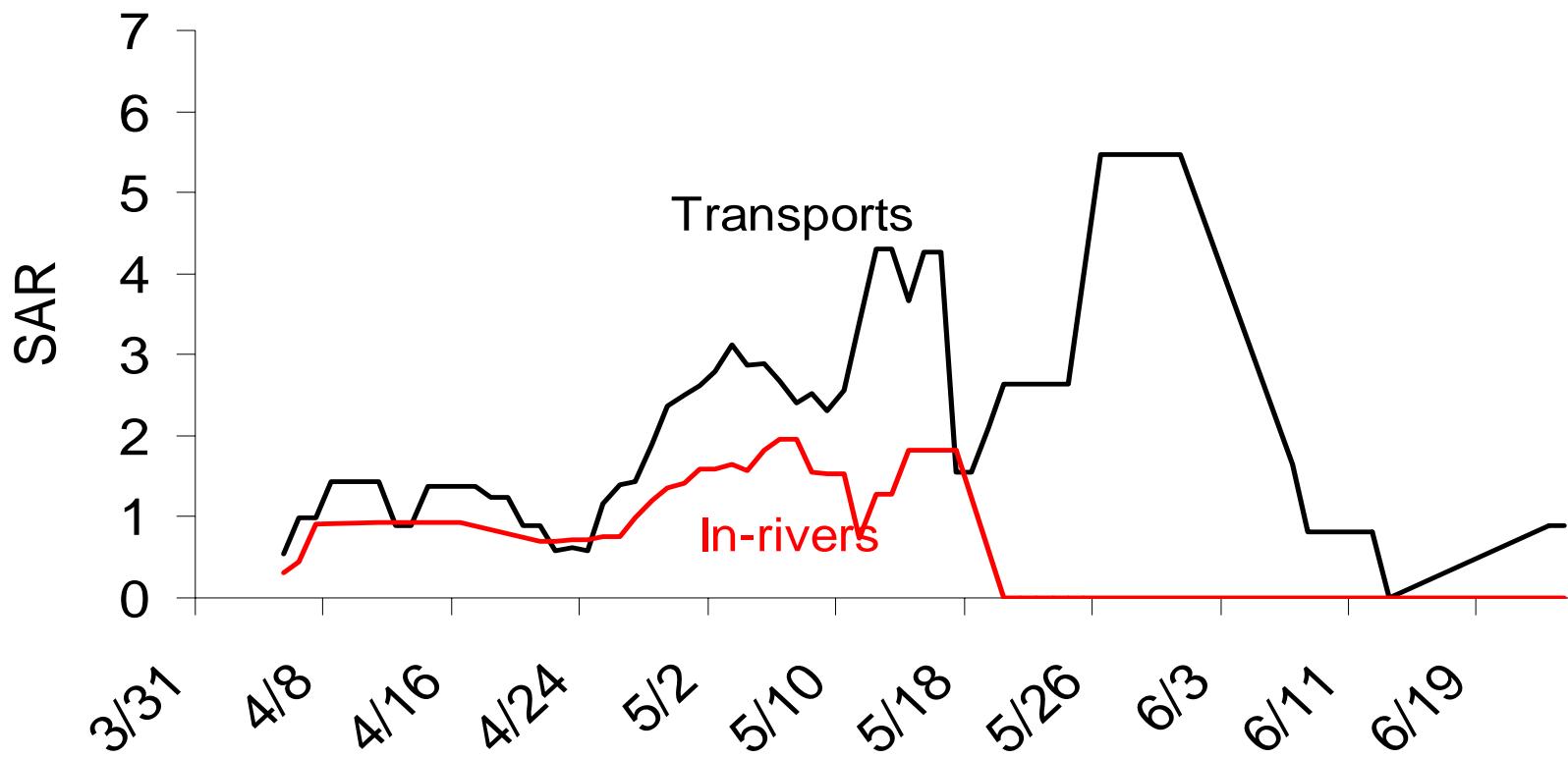
Chinook Salmon and Steelhead “D” Values

	Geometric mean “D”	(95%) confidence
Tagged above Lower Granite Dam:		
Sp/Su Chinook Salmon		
Hatchery	0.68	(0.52-0.90)
Wild	0.52	(0.36-0.75)
Steelhead		
Hatchery	0.49	(0.31-0.78)
Wild	0.55	(0.29-1.06)
Tagged at Lower Granite Dam:		
Sp/Su Chinook Salmon		
Hatchery	0.66	(0.53-0.82)
Wild	0.66	(0.46-0.93)
Steelhead		
Hatchery	0.69	(0.61-0.78)
Wild	0.90	(0.68-1.18)

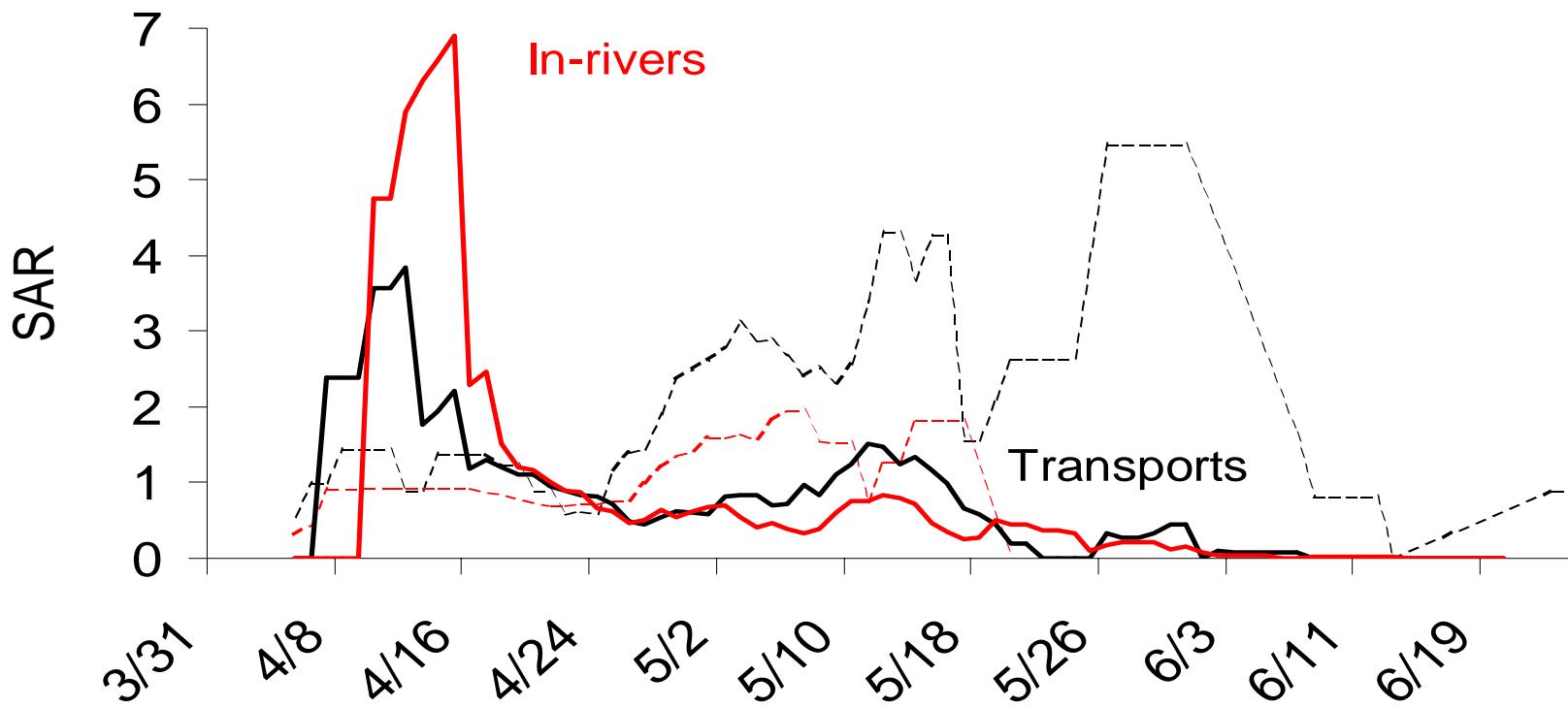


1999

Wild Sp/Su Chinook Salmon

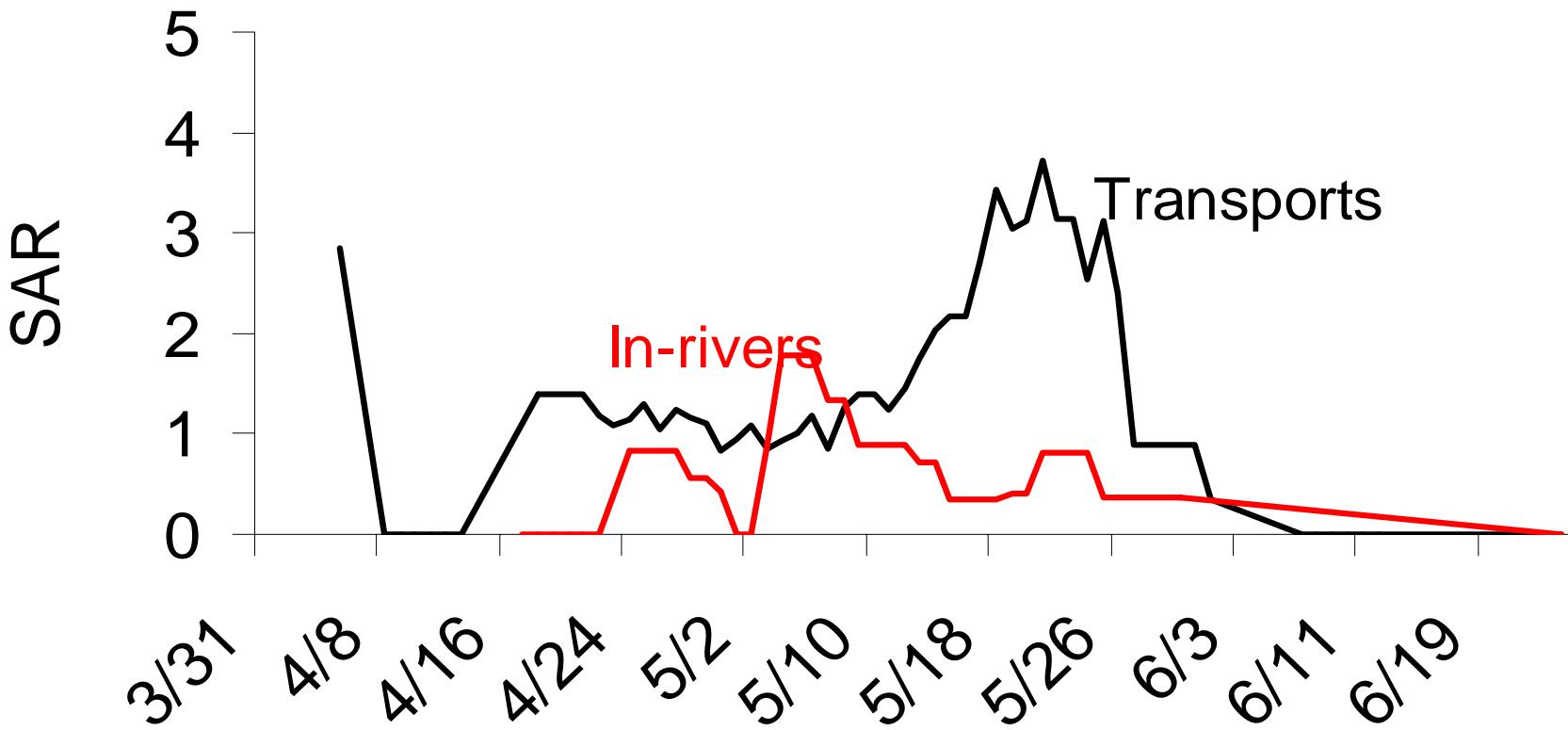


2000
Wild Sp/Su Chinook Salmon

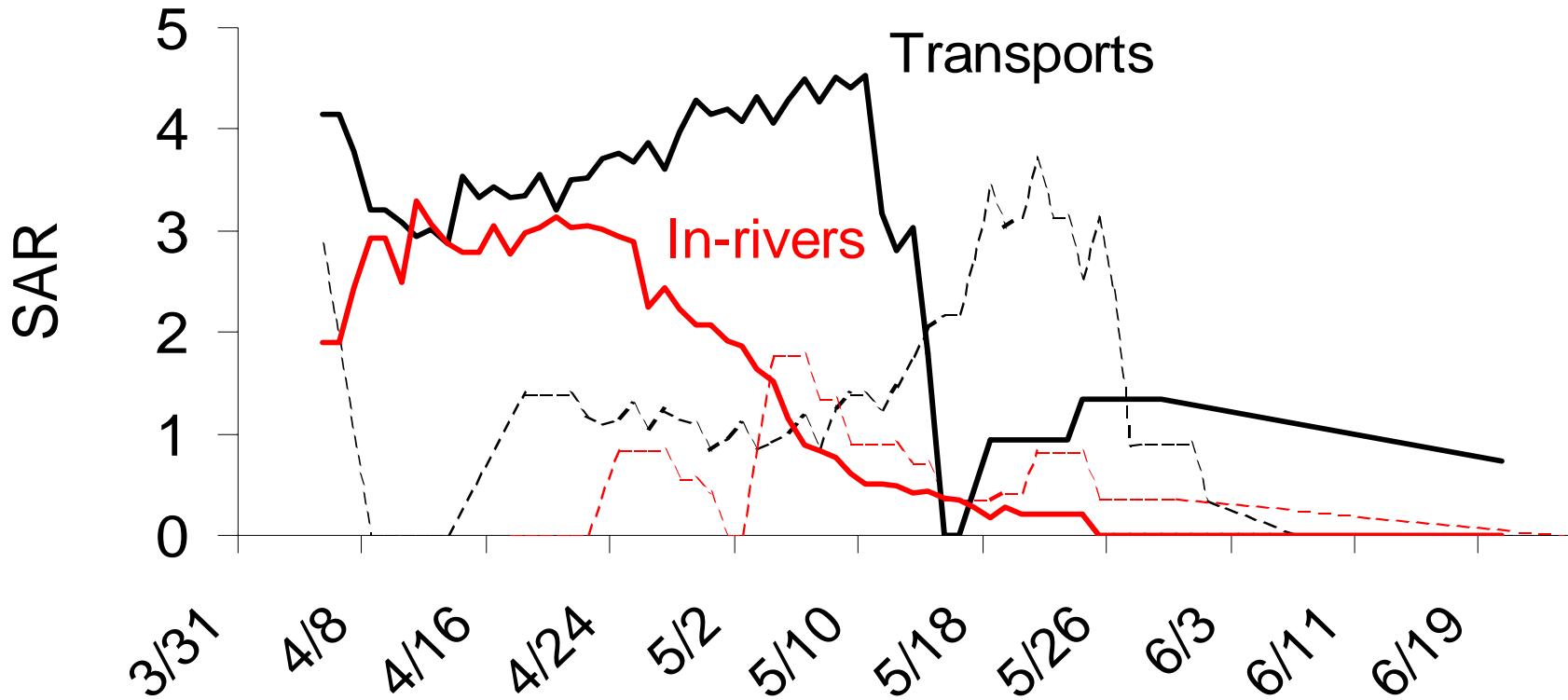


1999

Wild Steelhead



2000 Wild Steelhead



2001

Wild Steelhead

