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2 April 2008

To: U.S. Army Corps of Engineers Portland District
From: Matt Keefer and Chris Peery

Re: Migration timing of upper Salmon River spring–summer Chinook stocks

We used seven years of data (1997-1998, 2000-2004) from the adult radiotelemetry database for spring–summer Chinook salmon to estimate migration timing distributions for upper Salmon River populations. Across years, 134 salmon were recorded at the antenna used to monitor the mainstem Salmon near its confluence with the North Fork. Monitoring upstream from this site was limited to periodic mobile tracking by truck. Stock information was also gathered from tag recoveries at weirs and hatcheries.

The final recorded locations for the 134 fish were: 51 (38%) in the mainstem Salmon above the North Fork confluence (see Table 1 for details of mainstem distribution), 24 (18%) in the East Fork, 19 (14%) in the Pahsimeroi, 19 (14%) at Sawtooth, 8 (6%) in Valley Creek, 6 (4%) in the Lemhi, 5 (4%) in the Yankee Fork, and 2 (1%) in the North Fork. Migration timing distributions at the North Fork site are shown in Figures 1 and 2.

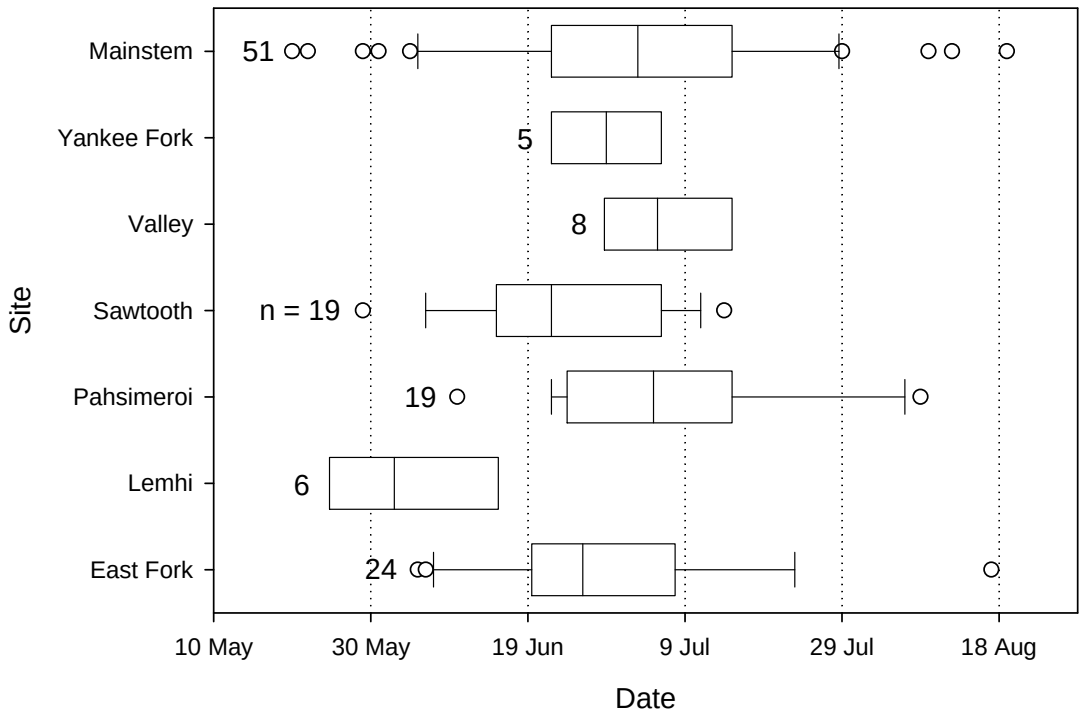

Figure 1. Spring–summer Chinook salmon migration timing distributions at the North Fork monitoring site, with all years combined. Box shows median and quartile dates, whiskers show 10th and 90th percentiles and open circles show individual outliers.

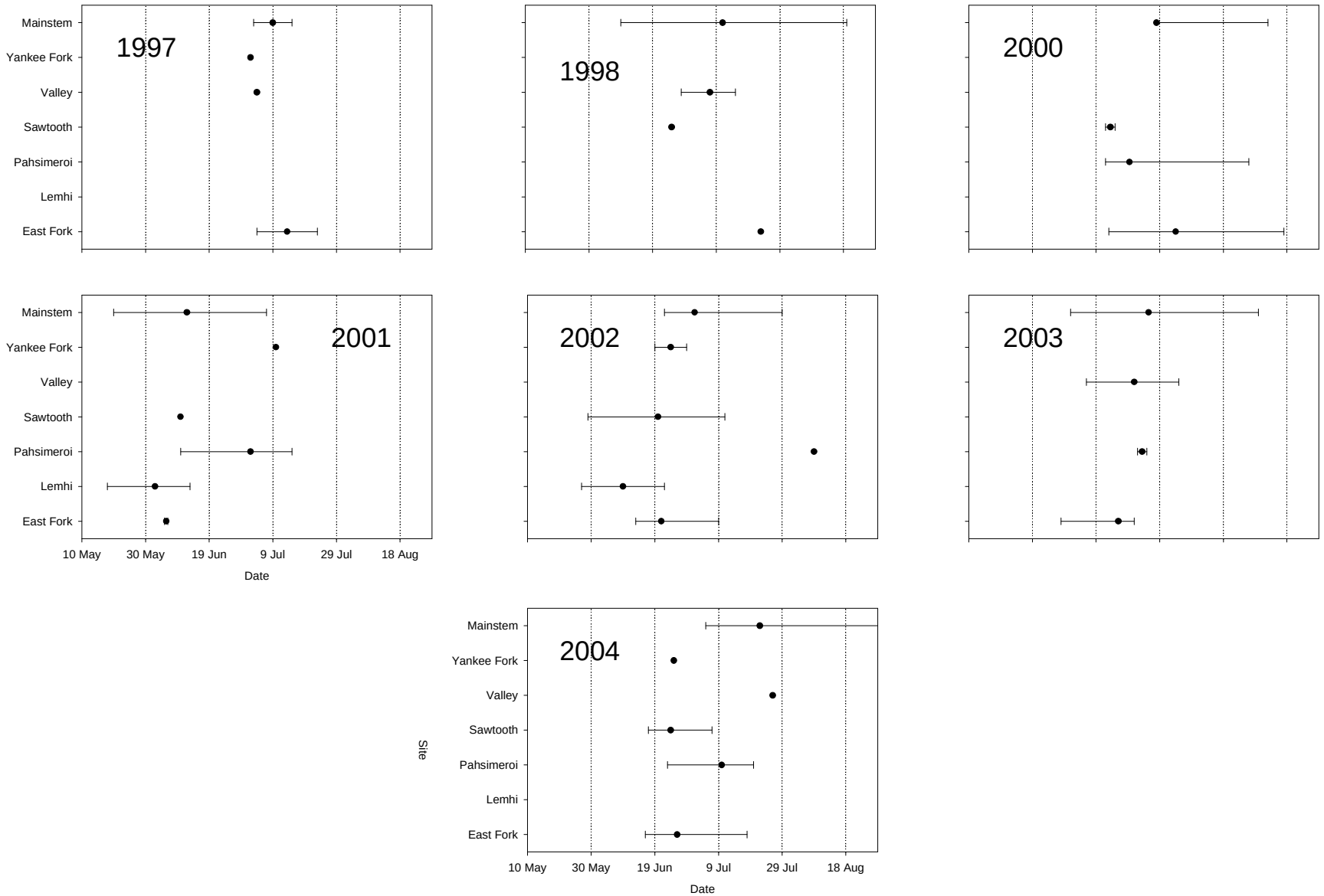

Figure 2. Spring–summer Chinook salmon migration timing distributions at the North Fork monitoring site, by year. Circles shows median dates, lines show minimum and maximum dates.

The data indicate relatively limited timing separation among populations, either with all years combined or in individual years. Within year, differences among median passage dates at the North Fork site were typically < 15 d (with a few exceptions). Importantly, sample sizes were quite limiting in most years.

The populations were also quite well mixed at both Bonneville and Lower Granite dams, though distributions were considerably wider at these sites (Figures 3 and 4). Because later migrants pass upstream more rapidly in all years, timing distributions for the upper Salmon River fish become more compressed at each site upstream (Figure 5). This results in additional mixing among populations as it appears that 'summer' fish essentially catch up with many of the 'spring' migrants. The latest fish to arrive at both Bonneville and Lower Granite dams typically migrated 2-3 times more rapidly than the earliest fish (Figures 6 and 7).

General Conclusion: Given this limited dataset, we think it may be difficult to operate a stock-selective fishery based on migration timing alone. Additional data, such as stock-specific timing distributions of PIT-tagged fish at Lower Granite Dam (if available) may be useful for further estimating migration timing in the upper Salmon.

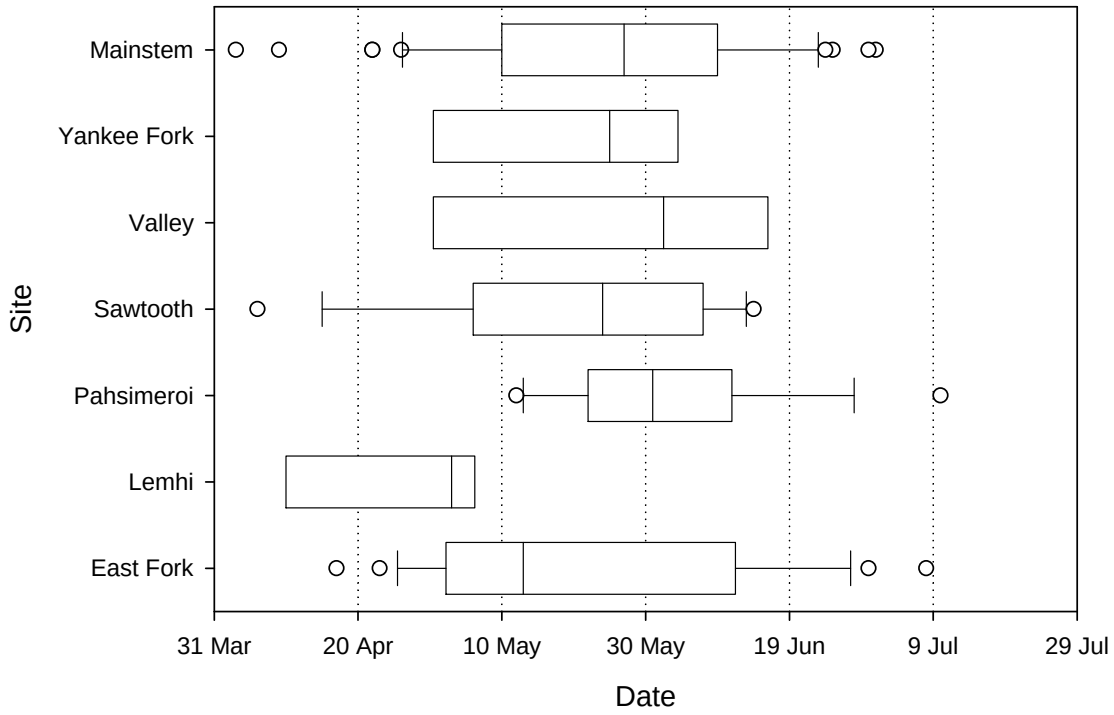

Figure 3. Spring–summer Chinook salmon migration timing distributions at Bonneville Dam, with all years combined. Note different date scale than Figures 1 and 2.

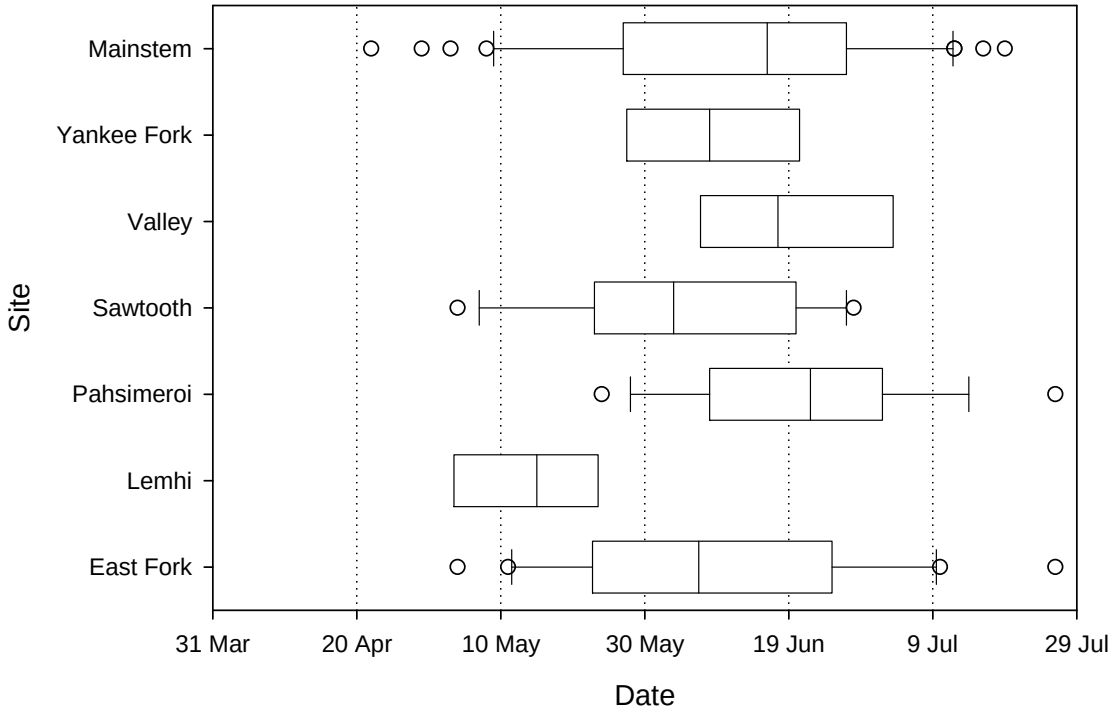

Figure 4. Spring–summer Chinook salmon migration timing distributions at Lower Granite Dam, with all years combined. Note different date scale than Figures 1 and 2.

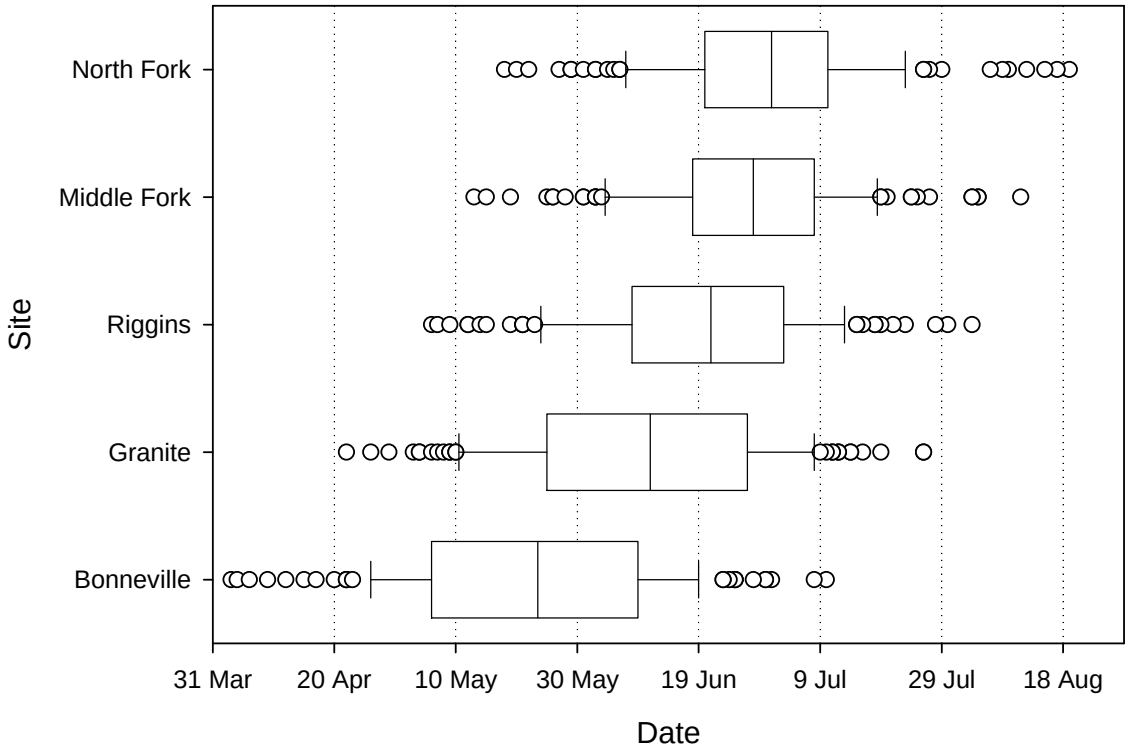

Figure 5. Migration timing distributions at several sites along the migration corridor for all fish recorded at the North Fork monitoring site, all years combined.

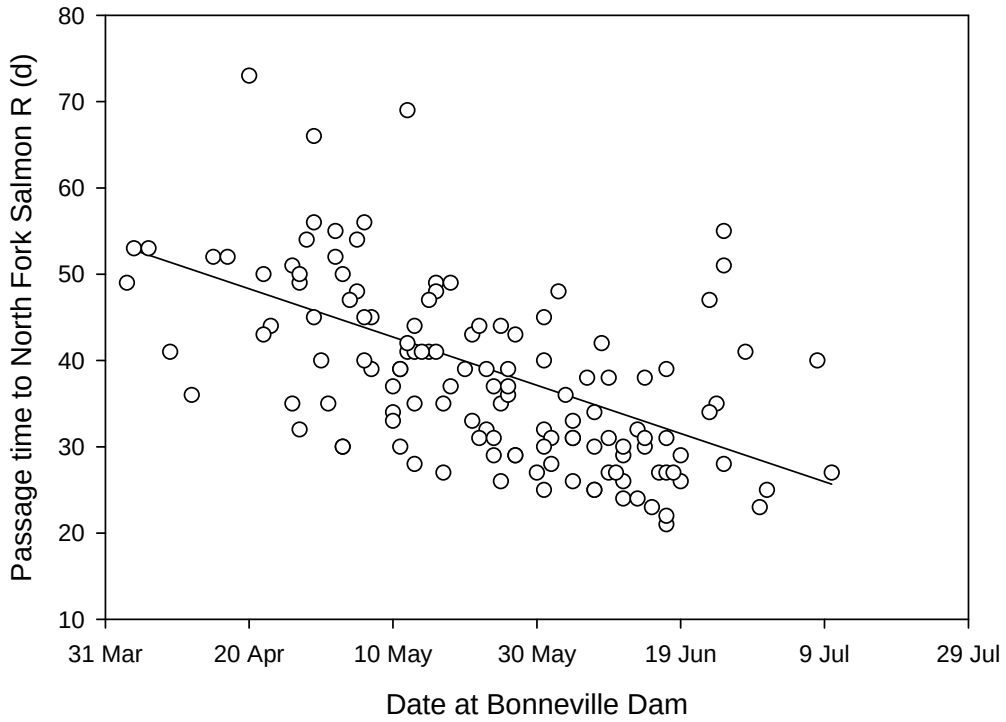

Figure 6. Passage times (d) from release below Bonneville Dam to the North Fork monitoring site, all years combined.

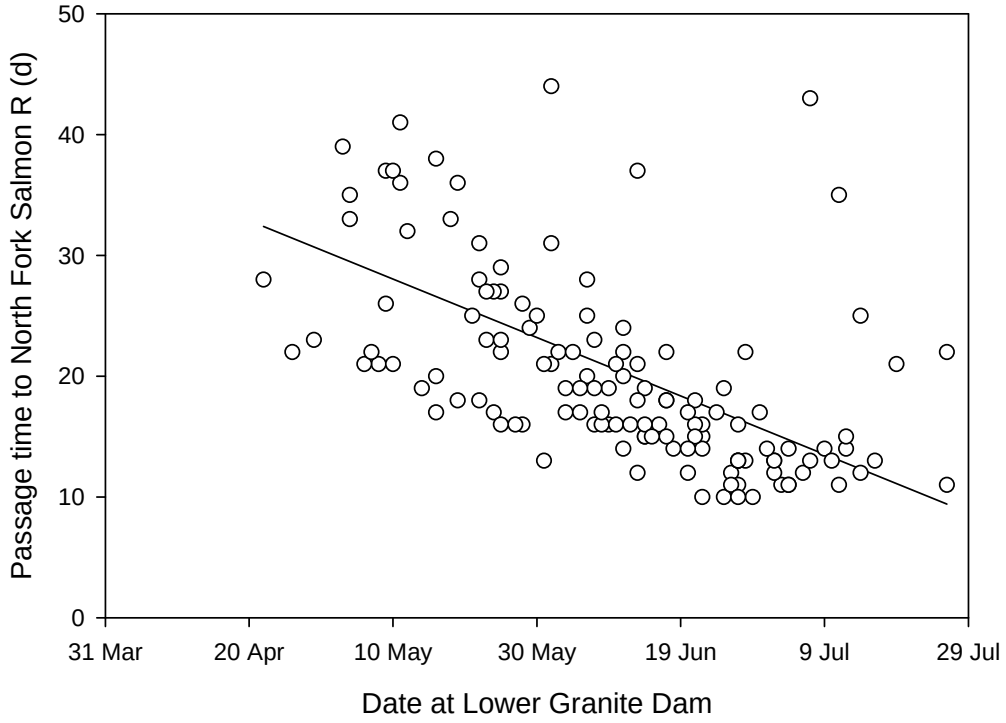

Figure 7. Passage times (d) from the top of Lower Granite Dam to the North Fork monitoring site, all years combined.

Table 1. Final recorded locations for salmon included in the 'mainstem' group. Almost all data were collected during periodic mobile tracking and do not necessarily reflect the eventual fate of the fish.

	Year							
Reach	1997	1998	2000	2001	2002	2003	2004	Total
North Fork - Lemhi		3	1	6	2	2	1	15
Lemhi - Pahsimeroi		1						1
Pahsimeroi - East Fork				2	1			3
East Fork - Yankee Fork	1	3	2		1	2		9
> Yankee Fork	1	3		3	4	9	2	22