



FISH PASSAGE CENTER

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MEMORANDUM

TO: Paul Wagner (Chair, FPAC)

FROM: Michele DeHart

DATE: July 20, 2009

RE: Proportion of sockeye adults passing McNary Dam during evening non-counting hours

In response to your request, the FPC staff has reviewed PIT-tag detection data for adult sockeye passing McNary Dam (MCN). Specifically, the FPC staff reviewed four years of adult detection data (2006-2009) at MCN in order to determine what proportion of PIT-tagged adults pass MCN during times when counting occurs versus those times when counting does not occur (i.e., non-counting hours). Below is a brief summary of our findings, followed by a more detailed discussion.

- Overall, approximately 4.9% of PIT-tagged sockeye adults detected at MCN were detected during the non-counting periods.
- For the weekly time periods analyzed, adult sockeye passage at MCN during non-counting periods seems fairly consistent, ranging from 4.3% to 5.8%.
- When adult sockeye window counts at MCN were adjusted based on weekly estimates of passage during non-counting periods, sockeye adult counts at MCN increased by 4.2-6.6%.

McNary Dam Adult Counts:

Each year, McNary Dam (MCN) begins counting adult salmonids on March 1st and generally continues through December 31st. Sockeye adult passage generally does not begin at MCN until early to mid-June and continues through September. The majority (>99%) of the adult sockeye run at MCN usually passes between June 1st and August 1st. During this time, adult counts at MCN are based on direct counts which take place from 05:00 to 21:00 (DST). Therefore, adult sockeye counts at MCN are based on counts from a 16-hour period. This means

that adults passing the counting station during non-counting times are missed. It is thought that a negligible proportion of adult salmonids pass through the adult ladders during these non-counting times.

To estimate the proportion of sockeye adults that pass through the adult ladder at MCN during non-counting times, FPC staff relied on PIT-tag data. Specifically, FPC staff reviewed four years (2006-2009) of detection data for PIT-tagged adult sockeye detected at the MCN counting window detection monitors between June 14th and July 18th of each year. Based on window counts during these years, this time period encompasses a minimum of 93% of the adults passing MCN. There were no detections of PIT-tagged adults in 2005 and too few detections in 2004 to be included in this analysis. Based on the counting times presented above, PIT-tagged adults were categorized as having passed MCN during the counting period versus those that passed during the non-counting period. Passage time was based on the time of last detection at each of the counting window monitors.

On average, about 4.9% of PIT-tagged adult sockeye detected in the MCN adult ladder counting windows from 2006 through 2009 were detected during non-counting hours (Table 1). However, there was some variability between the years. So far, return year 2009 has the lowest estimate of non-counting passage for adult sockeye at 4.1%. Return year 2007 had the highest estimate of passage during non-counting periods (6.4%) (Table 1).

Table 1. Detections of PIT-tagged adult sockeye at MCN during counting and non-counting time periods and percent of adult sockeye detected at MCN that were detected during non-counting periods. These data are for detections June 14th to July 18th of each year.

Year	Counting Period Detections	Non-Counting Period Detections	Overall Percent Detected During Non-Counting Periods
2006	395	23	5.5
2007	335	23	6.4
2008	831	42	4.8
2009	851	36	4.1
2006 – 2009	2412	124	4.9

In order to investigate whether passage during non-counting periods might change over the adult passage season, adult detections at MCN were broken into five one-week periods. The first one-week period began on June 14th of each year. Based on this analysis, the passage of adult sockeye at MCN during non-counting periods is fairly consistent throughout the season, generally ranging from 3.0% to 7.0% on a weekly basis (Table 2). On average, passage of sockeye adults at MCN during non-counting periods ranged from 4.3% to 5.8% (Figure 1).

Finally, based on the seasonal estimates of adult sockeye passage during non-counting periods, we estimated an adjusted adult count if counting were to be extended to 24 hours (Table 2). These adjusted adult counts represented a 4.2-6.6% increase over the actual adult counts at MCN for each of the years analyzed.

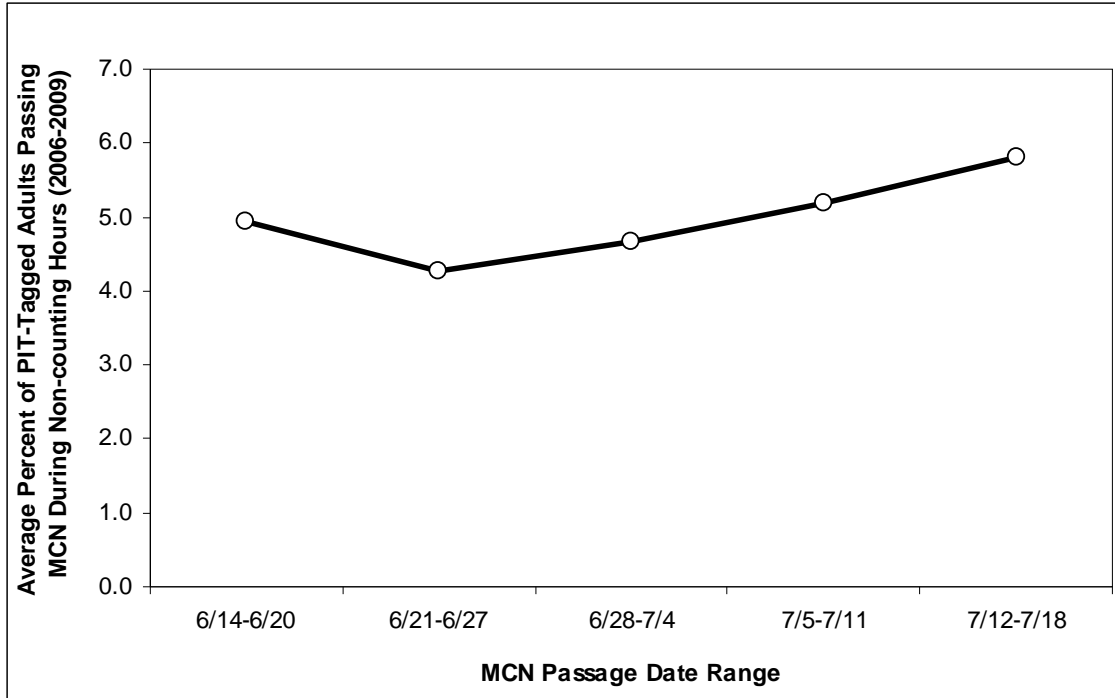


Figure 1. Average percent of PIT-tagged adult sockeye that were detected at MCN during non-counting periods.

Table 2. Seasonal detections of PIT-tagged adult sockeye at MCN during counting and non-counting time periods and percent of adults passing MCN that passed during non-counting periods. Also included are estimates of adjusted adult sockeye window counts at MCN based on the passage of adult sockeye during non-counting periods at MCN.

Year	Date Range	Counting Period Detections	Non-Counting Period Detections	Percent Detected During Non-Counting Period	Adult Sockeye Window Counts	Adjusted Adult Sockeye Window Counts
2006	6/14-6/20	18	1	5.3	2,647	2,794
	6/21-6/27	81	0	0.0	5,919	5,919
	6/28-7/4	138	9	6.1	12,413	13,223
	7/5-7/11	91	3	3.2	5,348	5,524
	7/12-7/18	67	10	13.0	1,732	1,991
	Total Count					28059
2007	6/14-6/20	57	4	6.6	2,012	2,153
	6/21-6/27	95	9	8.7	5,700	6,240
	6/28-7/4	101	4	3.8	5,686	5,911
	7/5-7/11	71	6	7.8	2,373	2,574
	7/12-7/18	11	0	0.0	1,048	1,048
	Total Count				16,819	17,926
2008	6/14-6/20	75	2	2.6	8,027	8,241
	6/21-6/27	319	15	4.5	60,714	63,569
	6/28-7/4	214	15	6.6	56,246	60,188
	7/5-7/11	142	5	3.4	16,173	16,742
	7/12-7/18	81	5	5.8	3,969	4,214
	Total Count				145,129	152,955
2009	6/14-6/20	88	5	5.4	9,362	9,894
	6/21-6/27	193	8	4.0	32,662	34,016
	6/28-7/4	315	7	2.2	44,440	45,428
	7/5-7/11	191	13	6.4	26,722	28,541
	7/12-7/18	64	3	4.5	4,912	5,142
	Total Count				118,098	123,020



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DATA REQUEST FORM

Request Taken By: Brandon Chockley Date: 14-July-09

Data Requested By:

Name: Paul Wagner, FPAC Phone: _____
Address: _____ Fax: _____
_____ Email: _____

Data Requested:

Estimate nighttime passage of sockeye @
McN - PET-T&S

Data Format: Hardcopy Text Excel
Delivery: Mail Email Fax Phone

Comments:

Memo attached.

Data Compiled By: _____ Date: _____

Request # 42