



FISH PASSAGE CENTER

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MEMORANDUM

TO: Jay Hesse

FROM: Michele DeHart

DATE: August 10, 2020

SUBJECT: Lower Granite Fall Chinook PIT tag detections

In response to your request, the FPC has summarized juvenile fall Chinook PIT tag detections at Lower Granite dam at both the Removable Spillway Weir (RSW) and in the juvenile bypass system (JBS) from June 21st to August 8th 2020. Detections were separated into wild and hatchery origin fish as hatchery detections were often orders of magnitude larger than wild origin detections. Daily combined (RSW+JBS) detections ranged from 0-24 fall chinook juveniles per day for wild stocks, and from 2-451 for hatchery stocks. Because daily wild detections at both the JBS and RSW were so limited, point estimates for relative daily detection proportions in each are not easily estimated with a high degree of confidence. As such, we have simply plotted daily detection numbers to provide a qualitative assessment of relative proportions (Figure 1 & 2). It should be noted that all wild origin PIT tagged fall Chinook juveniles detected at Lower Granite dam (n=282) originated in the Clearwater Basin.

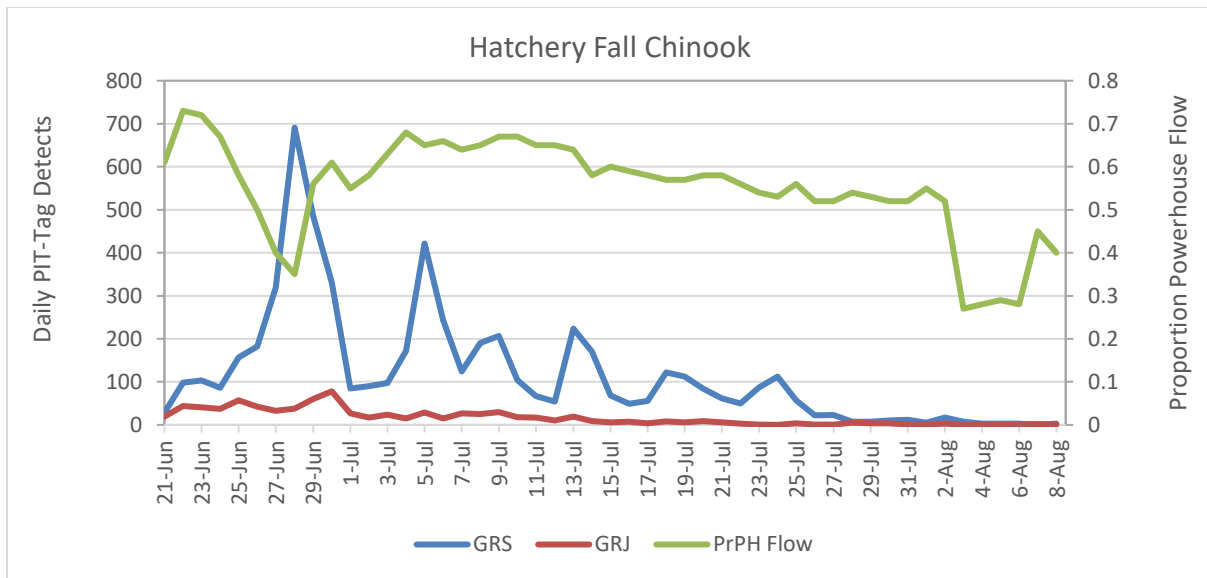


Figure 1: Number of PIT tagged hatchery origin fall Chinook juveniles detected at the RSW (blue) and in the JBS (red) at Lower Granite Dam from June 21st-Aug 8th -2020. Daily proportion of powerhouse flow is plotted on the secondary axis (green)

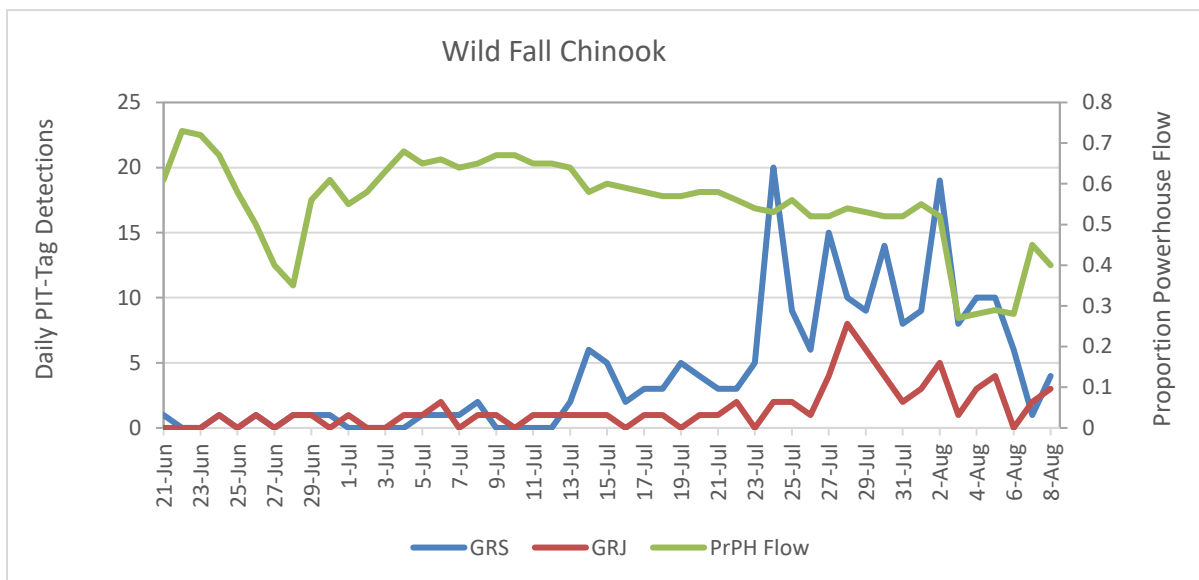


Figure 2: Number of PIT tagged wild origin fall Chinook juveniles detected at the RSW (blue) and in the JBS (red) at Lower Granite Dam from June 21st-Aug 8th 2020. Daily proportion of powerhouse flow is plotted on the secondary axis (green)

One notable preliminary observation in the juvenile fall Chinook data is the marked diurnal and opposing detection patterns between the RSW and the JBS. In general, most fish detected in the RSW are observed passing during daylight hours (6AM-9PM). For hatchery fall Chinook juveniles, this daily proportion ranges from ~60-100% (Figure 3). In contrast, a large majority of detections in the JBS occur during evening and night time hours (9PM-6AM), with daily proportions of daylight detections in the JBS ranging from ~0-30% through the bulk of the run (Figure 4). When viewed in aggregate (i.e., hatchery and wild combined), this pattern is even more stark: daytime RSW detections show a peak around midday (12PM) and substantially

decline during evening and night time hours (Figure 5). Similarly, JBS detections are nearly zero during daylight hours, with pronounced spikes beginning precisely at dusk and lasting into the evening (Figure 6). In total, approximately 84% of JBS detections of juvenile fall Chinook occurred during night time hours, indicating an unambiguous signal of preference, either biological or operational for surface routes during daylight hours, and deeper routes during evening and night time hours.

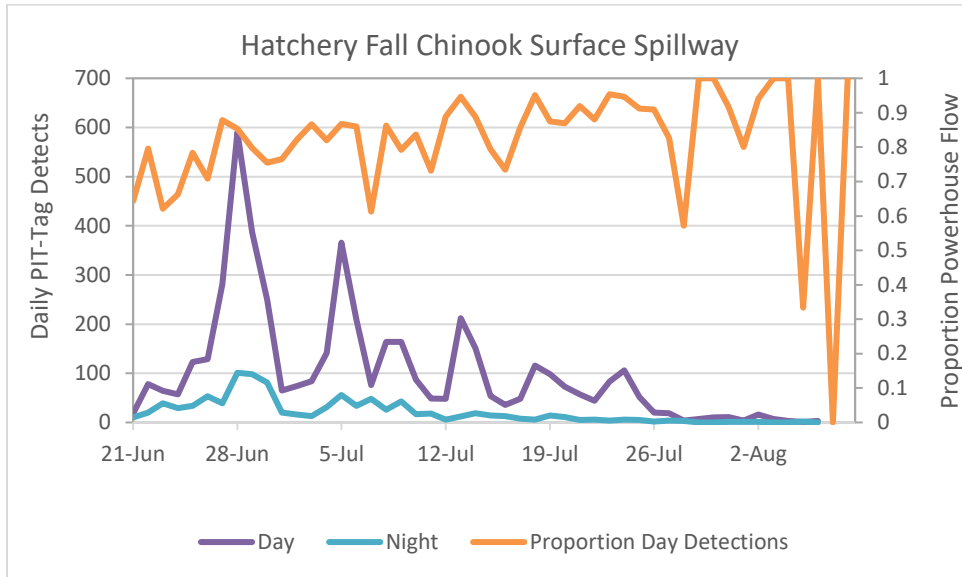


Figure 3: Number of PIT tagged hatchery fall Chinook juveniles detected at the RSW during the day (purple) and at night (blue) at Lower Granite Dam from June 21st-Aug 8th 2020. Daily proportion of detections that occurred during daylight hours (6am-9pm) is displayed on secondary axis (yellow).

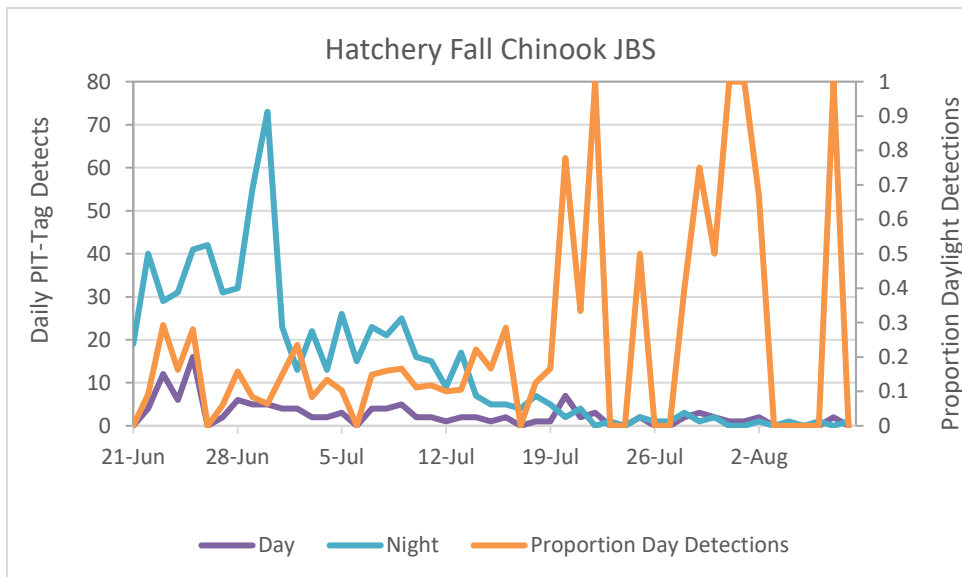


Figure 4: Number of PIT tagged hatchery fall Chinook juveniles detected at the JBS during the day (purple) and at night (blue) at Lower Granite Dam from June 21st-Aug 8th 2020. Daily proportion of detections that occurred during daylight hours (6am-9pm) is displayed on secondary axis (yellow).

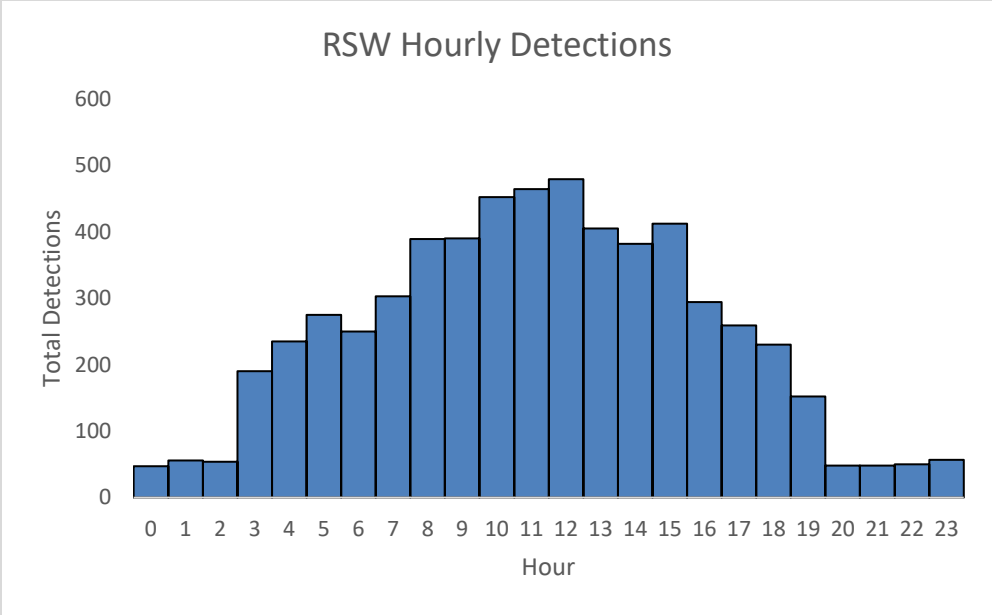


Figure 5: Juvenile fall Chinook detections by hour in the RSW at Lower Granite Dam from June 21st-August 8th

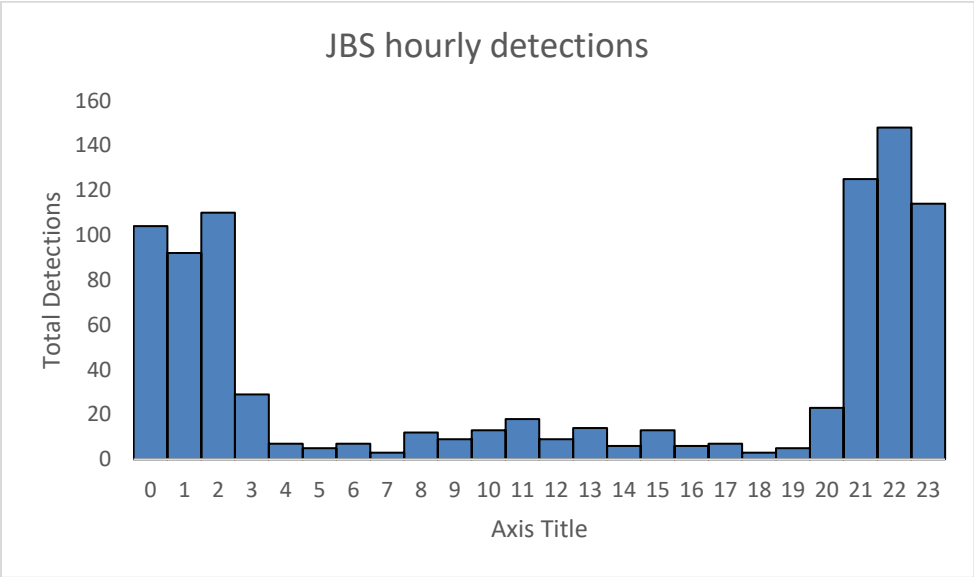


Figure 6: Juvenile fall Chinook detections by hour in the JBS at Lower Granite dam from June 21st-August 8th.