

13 June 2007

To: U.S. Army Corps of Engineers Portland District

Introduction

A fishery for American shad *Alosa sapidissima* at the exit of the Oregon-shore ladder at The Dalles Dam was initiated on 6 June 2007. The fishery uses a trapnet tied to the foredeck wall of the dam and is anchored in place with the trap mouth across one of two Oregon-shore fishway exit portals (Figure 1). The deployment of this trapnet has the potential to impede the passage of adult Chinook salmon *Oncorhynchus tshawytscha* through the ladder. This summary was prepared in response to concerns expressed by USACE biologists about relatively high number of detections of radio-tagged Chinook salmon on receivers deployed at the top of the ladder (TOL) and the increased frequency of ladder fallbacks (salmon swimming upstream from the count window and subsequently swimming downstream from it) since the beginning of the shad fishery. The telemetry monitoring was not designed to experimentally test hypotheses related to the shad fishery.

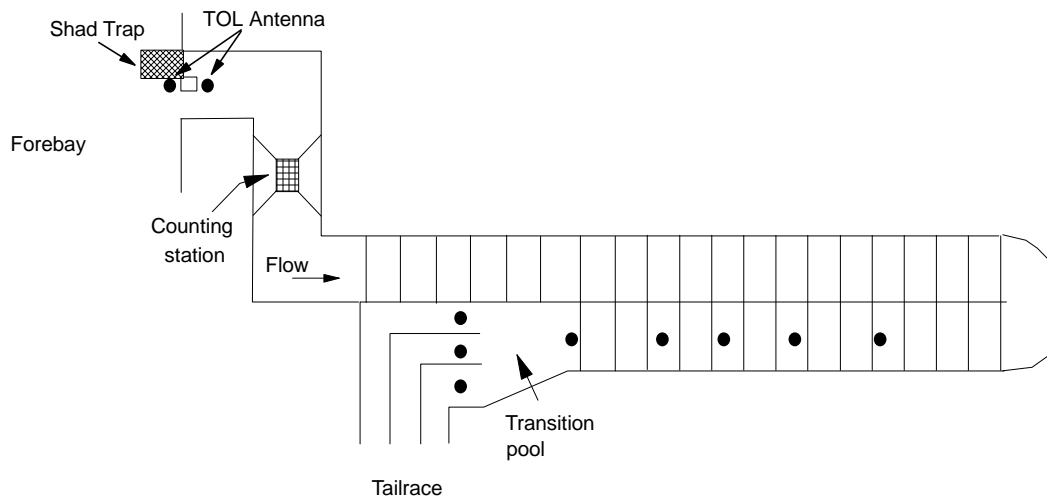


Figure 1. Aerial view of radio antennas, counting station, and shad trap at the Oregon-shore fishway of The Dalles Dam during June 2007.

Methods

We evaluated the effects of the shad fishery on passage by monitoring adult spring Chinook salmon with radio transmitters as they passed the Oregon-shore TOL antenna (Figure 1). The TOL antenna was comprised of two coaxial cables, one upstream from the structure separating the two portals and one downstream from it. Passage times were defined as the interval between the first and last detection on the Oregon-shore TOL antenna. Treatment assignments were based on trap deployment dates and times received from Robert Cordie.

Results

Two hundred and fifteen tagged salmon exited the Oregon-shore ladder prior to the shad fishery and 15 tagged salmon exited during the shad fishery (Table 1). The median time for tagged salmon to pass the TOL antenna prior to the shad fishery was 1.7 min and 5.2 min during the shad fishery. While this difference was small in absolute terms, passage times were significantly higher for tagged salmon that passed during the shad fishery (Kruskal-Wallis Test, $P = 0.004$).

Table 1. Median, quartiles, and sample sizes of Oregon-shore TOL passage times for radio-tagged adult spring Chinook salmon at The Dalles Dam during 2007.

Statistic	No Fishery (min.)	Fishery (min.)
1 st Quartile	0.8	1.6
Median	1.7	5.2
3 rd Quartile	3.5	7.8
n	215	15

The low sample size of tagged salmon that passed during the fishery precluded the use of a Chi-square Test but there was a higher proportion of tagged salmon having longer passage times during the fishery (Figure 2).

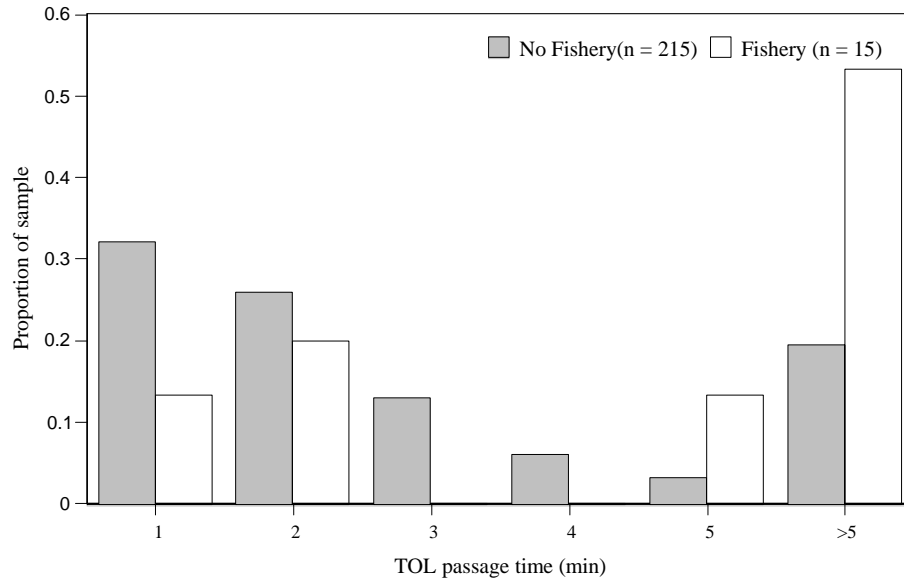


Figure 2. Oregon-shore TOL passage time distributions for radio-tagged adult spring Chinook salmon at The Dalles Dam prior to and during the 2007 shad fishery.

One of the 15 tagged salmon recorded at that Oregon-shore TOL during the fishery was subsequently recorded swimming downstream to the transition pool before re-ascending the dam via the Oregon-shore fishway. None of the 215 tagged salmon detected on the Oregon-shore TOL antenna prior to the fishery exhibited this behavior.

While sample sizes are low during the fishery, it appears the shad fishery may be modestly impeding the passage of tagged Chinook salmon at the Oregon-shore ladder exit based on TOL passage times alone.