

**Northwestern Division – U.S. Army Corps of Engineers
ANADROMOUS FISH EVALUATION PROGRAM
FY11 RESEARCH SUMMARY**

STUDY CODE:

TITLE: Evaluation of Fish Counting Accuracy Issues at FCRPS Dams

FISH PROGRAM FEATURE: FCRPS – The Dalles, Ice Harbor, and Lower Monumental Adult Fish Passage.

BIOLOGICAL OPINION ACTION: RM&E Action 50, 52 – Fish Population Status Monitoring.

MANAGEMENT PURPOSE: Determine if adult salmonid counting accuracy is affected by fish counters being required to count shad at The Dalles Dam count stations. Determine if counting slot lighting modifications, video camera location and upgrades, and video monitor placement can improve fish counting accuracy (Ice Harbor, Lower Monumental dams).

SUMMARY: Shad passage at The Dalles dam count stations, particularly the east count station, is difficult when hundreds or thousands of shad pass by the window each hour. This is made worse by conditions above the count station which tend to cause the shad to drift back downstream through the counting slot more than at other count stations. Shad counts at The Dalles dam have typically been higher than at Bonneville dam downstream, which indicates that either counting accuracy is an issue, or there are other factors affecting shad passage disproportionately at the two dams that we are unaware of (e.g. fallback/re-ascentions, navigation lock passage, differential night passage). The quality control methods used by WDFW supervisors can't detect this, as they sit side by side with the fish counters and will have the same conditions to cope with. However, by conducting sample counts along side the fish counter while only focusing on salmonids, and by reviewing video recorded (sub-sampling across the peak passage months), we may be able to numerically document whether or not the counters are being accurate when they are required to count shad also. If the regional fish managers do not require shad counts at The Dalles dam, and counting shad are affecting the counters ability to accurately count adult salmonids, shad counting could be dropped from The Dalles dam and adult fish count accuracy may increase.

In addition, fish counting conditions at the FCRPS projects are varied and each project has special issues to address to try and solve. Ice Harbor (IH) and Lower Monumental (LM) are unique in that one fish counter counts fish at two ladders simultaneously in real-time (counters view the window in one count station and monitor from video camera for other count station window). Fish counts at IH are often lower than those at upstream dams, possibly suggesting some issue with fish counting accuracy at IH. This is particularly frequent in June and July, when the sun is highest and glare may be at its worst at these count windows. At IH and at LM, all fish counting is done by video in the IH north and the LM south fishladder counting slots. Poor counting conditions exist at these sites, including the use of old analog video cameras and CRT monitors (both over 20 years old), poor camera locations, glare from lighting, and recessed count slot floors, which may all be contributing to difficulties in making accurate fish counts. Backscatter off dirt on the windows, the window glass, and from particles in the counting slot water is high because the count station halogen lights are bright, and are placed in the line of view of the monitoring cameras (more so at IH than at LM). Light reflection off the smooth window glass surface and the smooth vertical plane formed by the count slot water against the window glass is high. During daytime, the IH north counting slot is exposed to direct sunlight, particularly in June and July, when the sun is highest and when the majority of count discrepancies are seen, and this creates difficult viewing conditions for fish counters. By conducting random visual sampling counts of the video recorded count stations (and sample video recordings periods) and comparing to the visual counter at the other count station, we can determine if there are count accuracy and/or identification issues. If accuracy is found to be less than 95%, we could replace the old worn out video equipment with modern high resolution, high performance digital video equipment and monitors. We could also screen the Ice Harbor North fish counting station counting slot water from direct sunlight. We could move the halogen light from inside the counting stations to outside, over the counting slot water. And we could change the location of the video camera and monitor to provide the most accurate counting. All these modifications should let us see adult salmonids in the counting slots better, which, in turn, should improve counting accuracy.

OBJECTIVES: 1) Evaluate impact of counting shad at The Dalles dam count stations on the accuracy of counting and identifying adult salmonids. 2) Evaluate effects of modified Ice Harbor and Lower Monumental counting slot lighting and video monitoring equipment on counting accuracy.

SCHEDULE: 2011.

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