**CENWW-OD-T** **Date:** 25 August 2014

**MEMORANDUM FOR THE RECORD**

**SUBJECT:** 14MC 21 **MFR** Flooding of Oregon fish counting station; fish counting interrupted

**Narrative:** Early Saturday morning, August 23, 2014, following thunderstorm activity during the night, the AM fish counter found water on the floor of the Oregon fish counting station. The following sequence describes the subsequent activities:

1. At approximately 0450 hours, the Oregon fish counter found water on the floor and coming in through roof of the Oregon fish counting station. The counter called the Control Room. There was a storm that night, which stirred forebay debris that partially plugged the picketed leads, causing the overflow. We think we caught it sooner rather than later.
2. At 0530, the operators began orifice flow, to reduce flow against the picketed leads and lower the water level. The debris line on the hand rail would indicate that the water was about 2 feet over the walkway, which puts water onto the counting station's roof.
3. General Maintenance (GM) arrived about 0700 and began cleaning the picketed leads the first time. GM next cleaned the exit trash rack and then began a second cleaning of the leads. They found the north downstream lead's bottom was damaged and removed it for repair.
4. At 0800, the first electrician came in, because some of the electrical circuits and circuit boxes had flooded. He was soon joined by a second electrician.
5. At 0815, the operators resumed automatic operation of the ladder's tilting weirs (stopped orifice flow; resumed normal ladder operations).
6. By about 1030, the electricians and roving operator had the counting room fairly well dried out. At 1100, the fish counter began to manually enter fish counts. Before this, he had contacted his supervisor. We found the monitor for the lamprey count and the count board for the adult count had to be replaced. The counter's supervisor was going to address these items.
7. At about 1115 on Saturday, the Assistant Biologist noted that the counting backboard was within about 5 inches of the counting window. We found the shaft to the board's motor was no longer connected. Also, the conduit on one of the limit switches was damaged. By about 1145, the electrician and three GM crew members returned the backboard in its proper place and secured it. The gap was returned to normal. Fish began to pass more freely. During this, GM completed repairs to the damaged picketed lead and replaced it. Also, they completed the second cleaning of the picketed leads.
8. The backboard and limit switch were scheduled for permanent repairs Monday morning, August 25.

**Results:**

Fish counting on the Oregon ladder was interrupted between the normal start time of 0500 on Saturday until manual counting began at 1100 hours – a 6 hour loss of counting time. Electronic (computer assisted) counting resumed later on Saturday, but problems came up and manual counting was used partially afterwards. By 0500 Sunday morning, electronic counting resumed normally and continuously during regular counting hours.

The design of this counting station has caused similar events to occur in the past, so measures need to be implemented that will prevent a re-occurrence:

Immediate remedies:

1. Have roving operators check the Oregon picketed leads more frequently during storm events that may increase debris loads on the Oregon ladder picketed leads;
2. Have operators immediately place the ladder on orifice flow if a debris event occurs before GM crews can remove the debris;

Long-term remedies:

1. Install an electronic sensor that will sound off in the Control Room whenever flows upstream of the picketed leads reach a designated level. This will enable the operators to react (e.g., go into orifice flow, notify GM, etc.) before the high flows can spill into the counting station;
2. Redesign the counting station so that a high flow event will not spill water into the counting station, or re-locate the counting station downstream near the visitor viewing room, and design it so that it would not be adversely affected by high flows above the picketed leads.

**Carl R. Dugger**
**Supervisory Fisheries Biologist**
**McNary Juvenile Fish Facility**