

McNary Dam Adult Steelhead Fallback: 2011-2012

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of Engineers®**
Walla Walla District



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- ▶ Questions arose about winter passage of Adult steelhead
 - Ladder Closed (no counts)
 - Screens out
 - No Spill (typically)
 - Prior to peak of Kelt outmigration
- ▶ 2010/2011 study confounded by spill
- ▶ Sampling increased to decrease confidence intervals



Outline

- ▶ Study Design
- ▶ Operational Conditions
- ▶ Fish Observed Through Time
 - Blueview (Forebay Holding)
 - Hydroacoustics (Turbine Passage)
- ▶ Horizontal Distribution
- ▶ Vertical Distribution
- ▶ Summary



Objectives

- ▶ Estimate the number of adult steelhead passing downstream through the powerhouse.
- ▶ Determine horizontal and vertical distribution of adult steelhead as they pass downstream through the powerhouse.

November 30, 2012



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Study Design

- ▶ Sampled from 12/1/11 to 4/16/12
- ▶ No treatments predefined
 - analysis periods defined by spill conditions
- ▶ Sampled 12 of 14 units
 - Units 1 and 10 out of service
 - Operated during high flow
- ▶ No sampling at spillway
- ▶ BlueView Imaging Sonar at 5/6 Piernose



Sampled 12 of 14 Operating Units

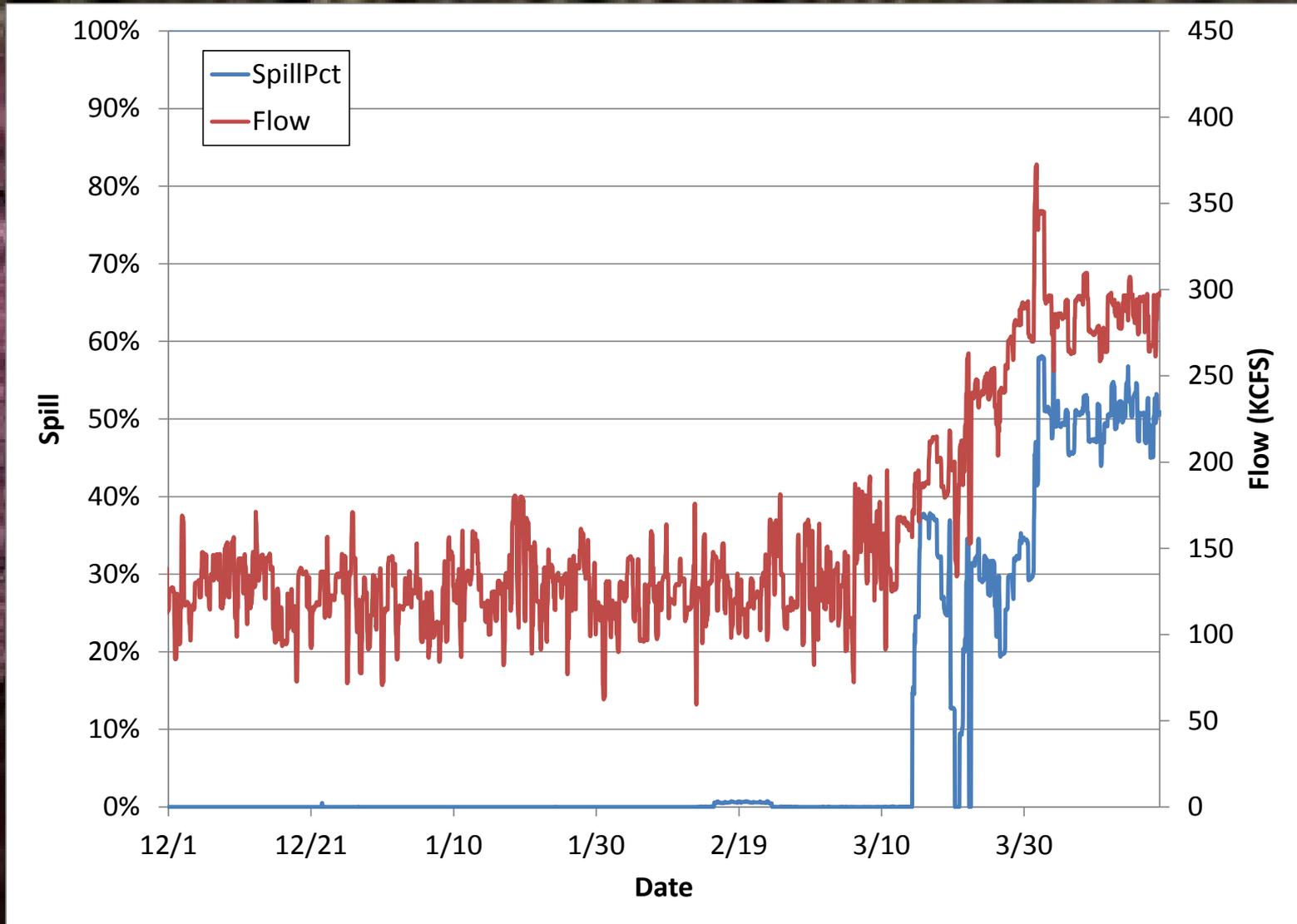
Flow



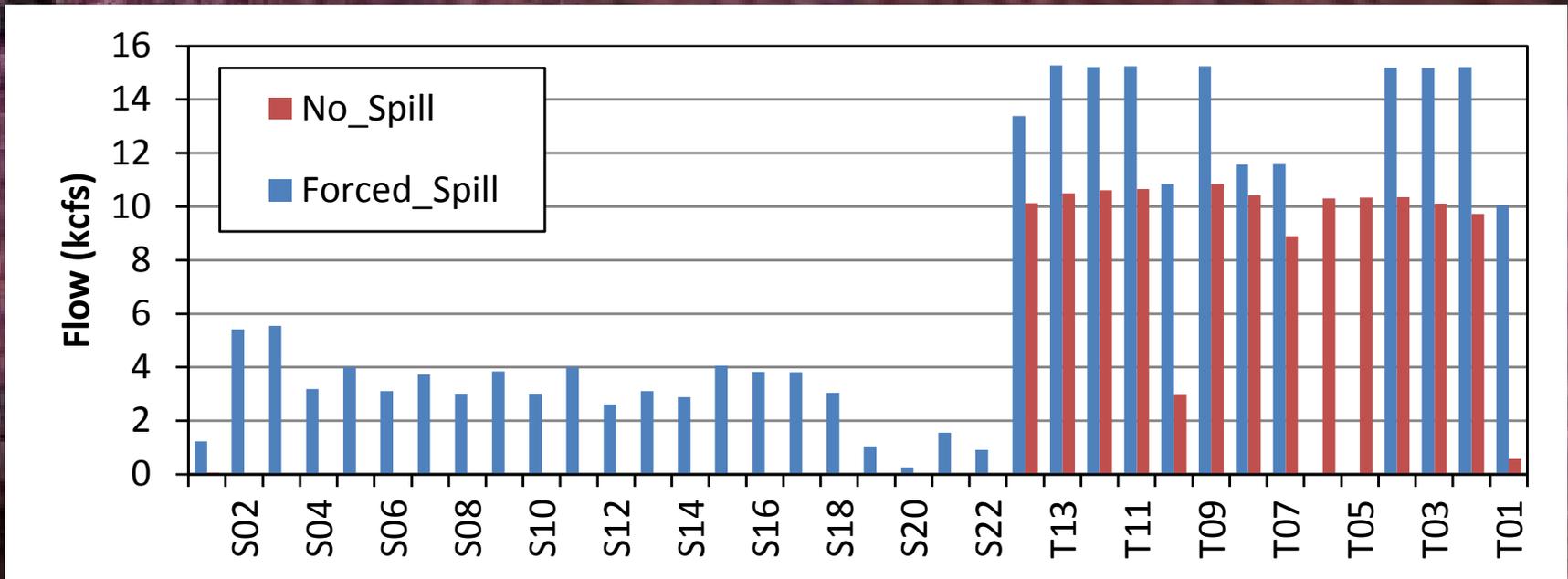
BlueView	
Hydroacoustics	
Not Sampled	



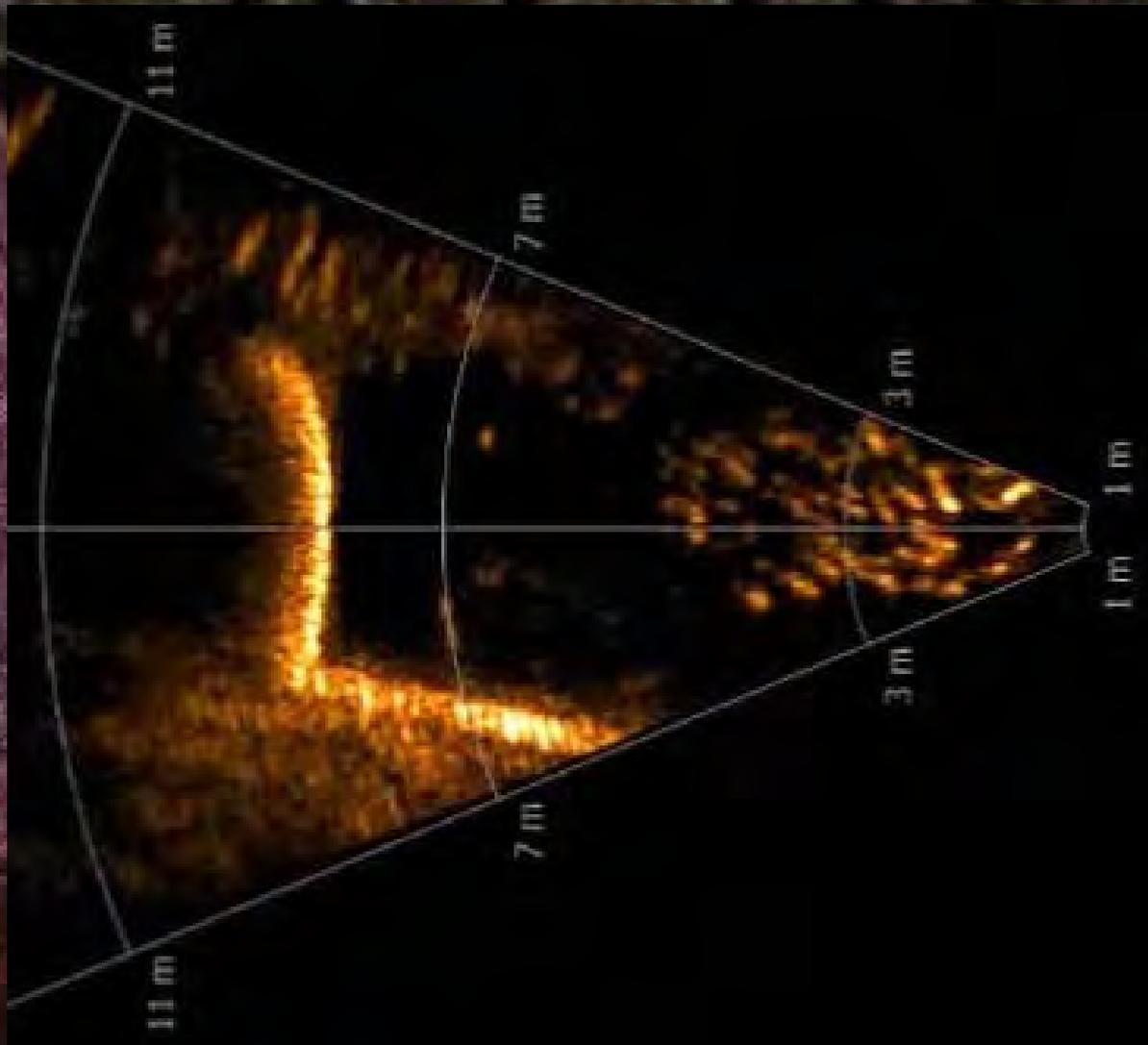
Analysis Groups Defined by Spill



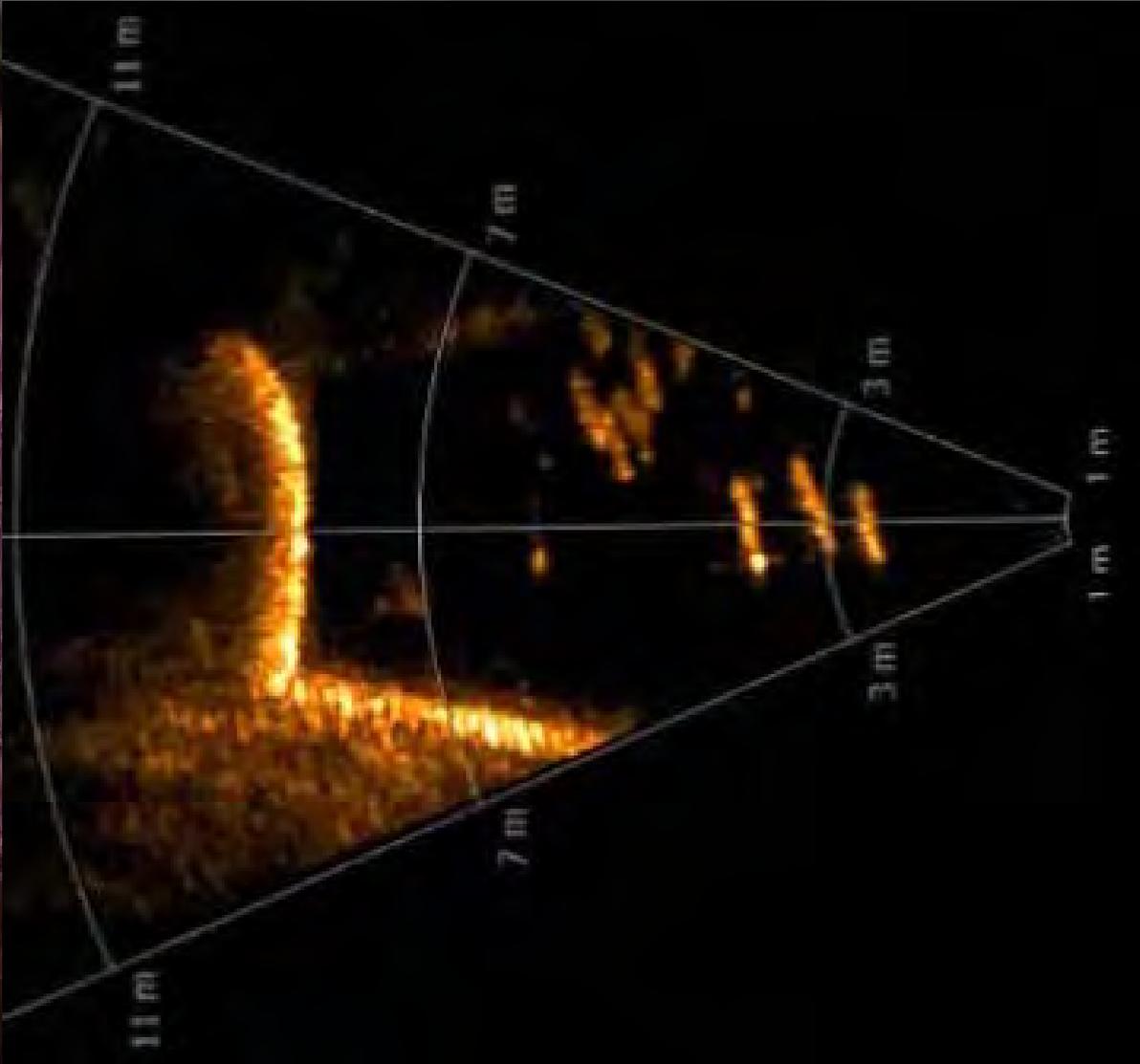
Powerhouse Flows Higher During Forced Spill



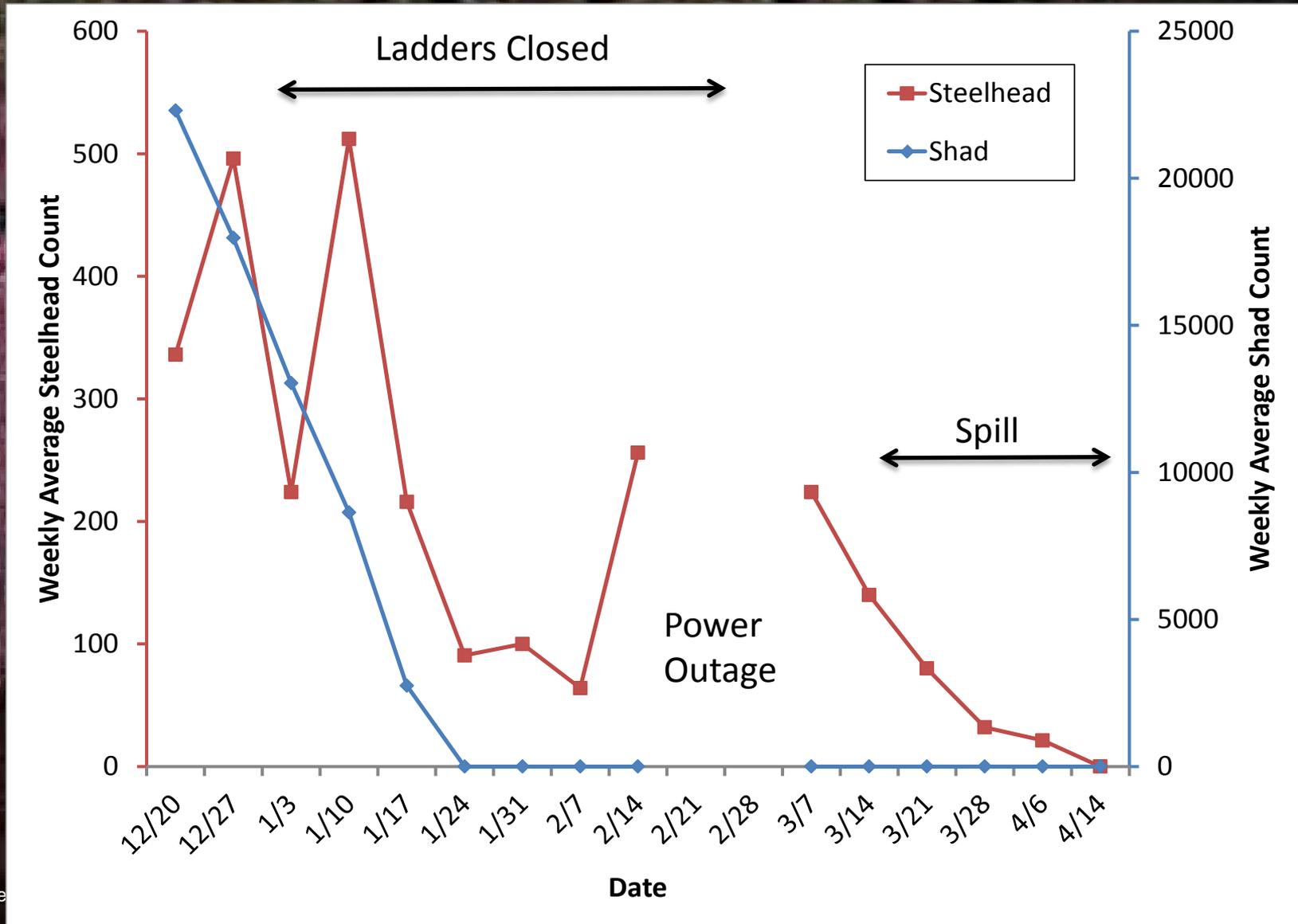
Adult Shad Tended to Move Along the Dam



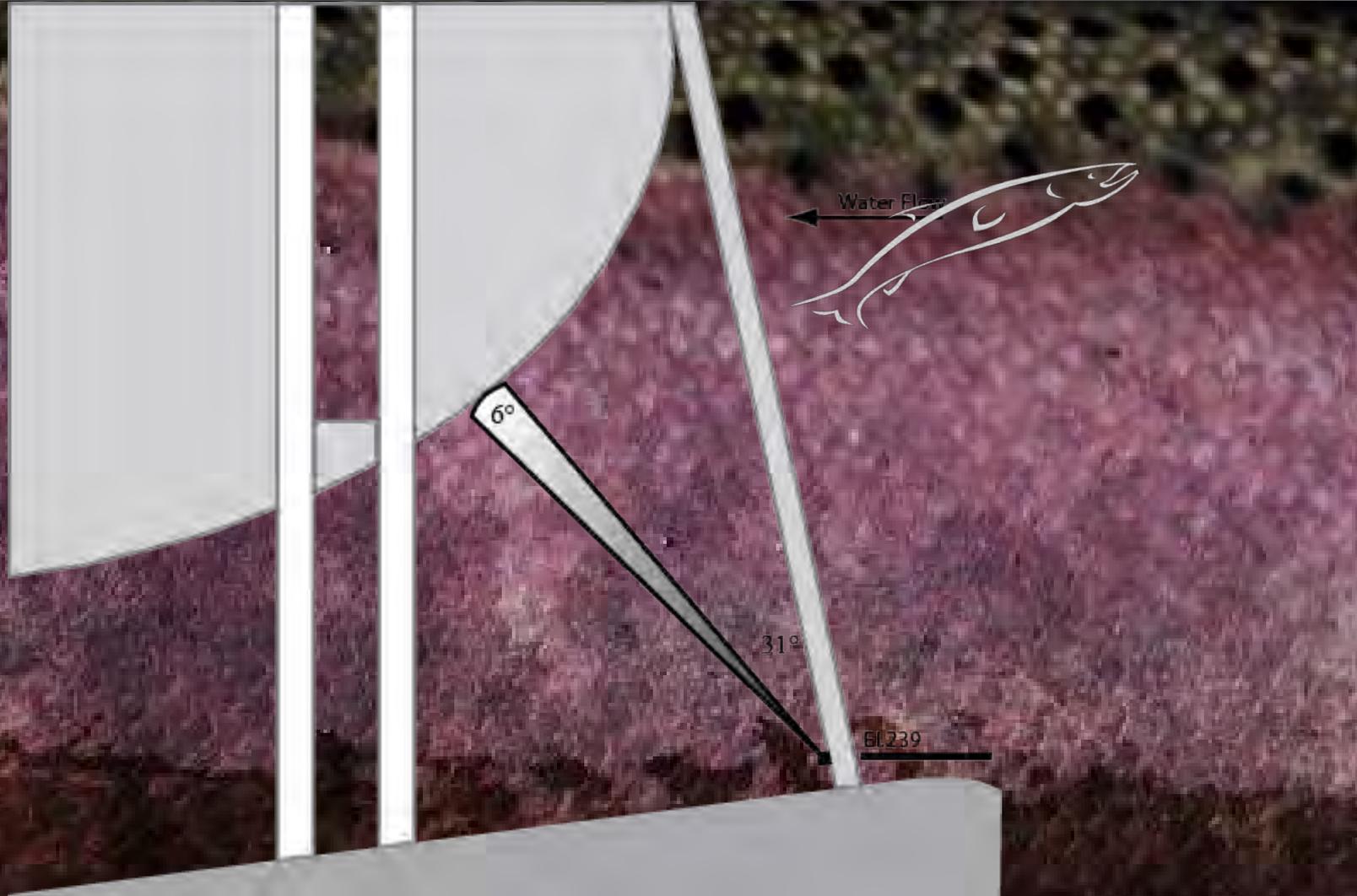
Adult Steelhead Held Upstream of Trashrack



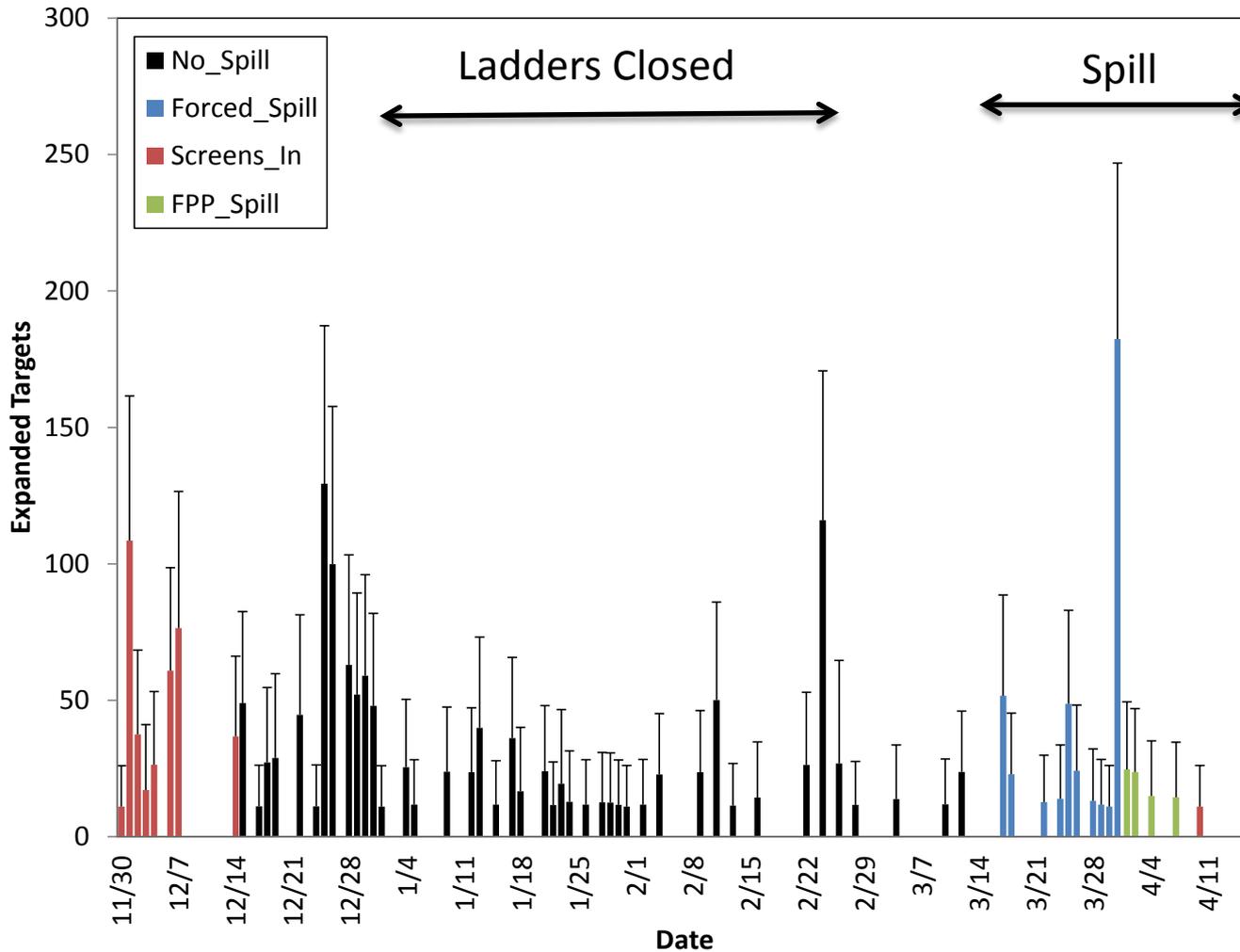
Few Shad in Forebay After Late January



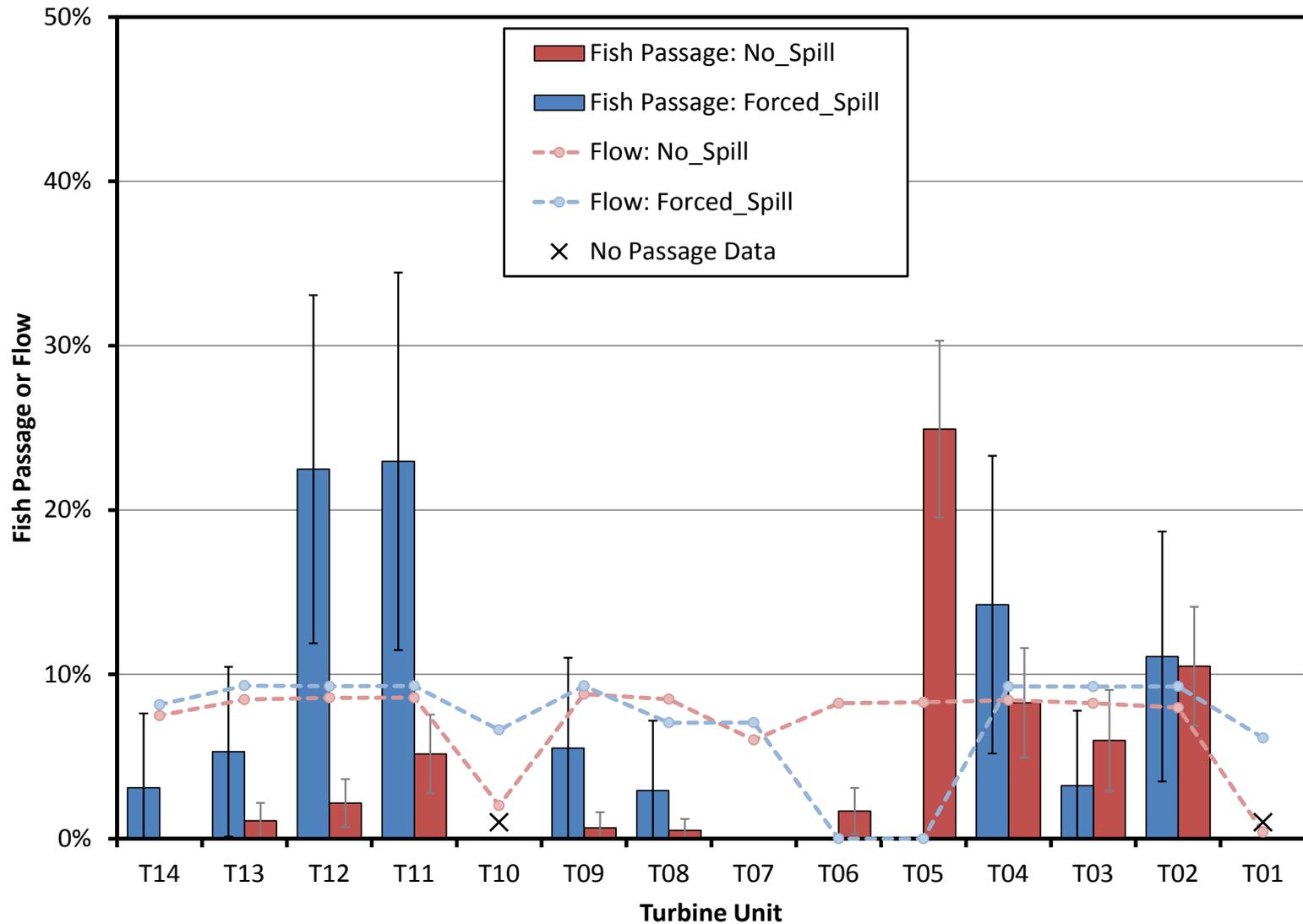
Fish Targets Detected Passing Through Hydroacoustic Beams



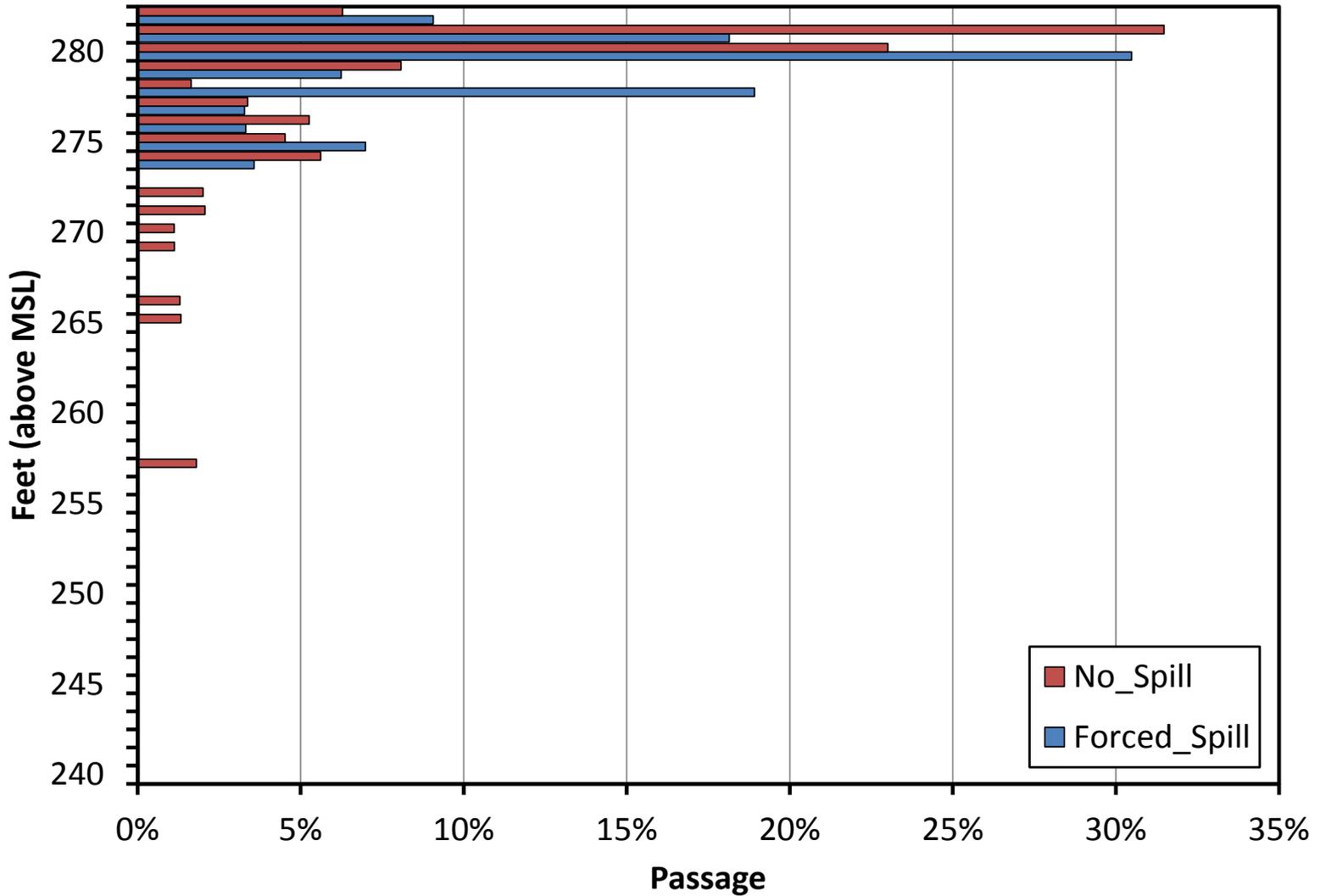
More Adult Steelhead Passed Turbines During First Half of Study



Passage Higher Near Edges of Powerhouse



Adult Steelhead Passed at Shallower Depths During Spill



Comparison of Adult Steelhead Fallback Rate with Previous Study

	2011/2012
Dates	Dec 1 to Apr 16
Adult Steelhead Passage (CI)	2184 (129)
Extrapolated To Entire Powerhouse	2315

Comparison of Adult Steelhead Fallback Rate with Previous Study

	2011/2012	2010/2011
Dates	Dec 1 to Apr 16	Dec 17 to Apr 14
Adult Steelhead Passage (CI)	2184 (129)	946 (194)
Extrapolated To Entire Powerhouse	2315	1419

Conclusions

- ▶ The number of adult steelhead passing turbines at McNary Dam in 2011/2012 was about 50% higher than previous year
- ▶ Adult steelhead were distributed near either end of the powerhouse and near the intake ceiling
- ▶ Turbine passage changed little when forced spill began
- ▶ Passage distributions influenced by spill

Acknowledgements

- ▶ Walla Walla District
 - Fred Higginbotham: COTR
 - Mike Remington and Dave Needham: Dive Safety
- ▶ McNary Project
 - Coordination
 - Rigging
 - Electrical Support
- ▶ Precision Acoustic Systems
 - Equipment testing

