

# Salmon Passage and Behaviors at The Dalles Dam Relative to Spill Operations - 2007

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Funded by:  
U.S. Army, Corps of Engineers



# Acknowledgements

- **U. Idaho: Ken Tolotti, Carol Morat, Travis Dick  
Dan Joosten, and Steve Lee**
- **NOAA Fisheries: Kinsey Frick**
- **U.S. Army, Corps of Engineers: Dave Clugston  
Tammy Mackey, Jon Rericich, Miro Zyndol,  
and Bob Cordie**

# Context

- A short stilling basin and shallow tailrace can produce turbulence harmful to spillway-passed juvenile emigrants
- Spillwall was constructed in winter 2003/2004 to eliminate lateral flow in stilling basin and spillway discharge has since been directed through bays 1-6.

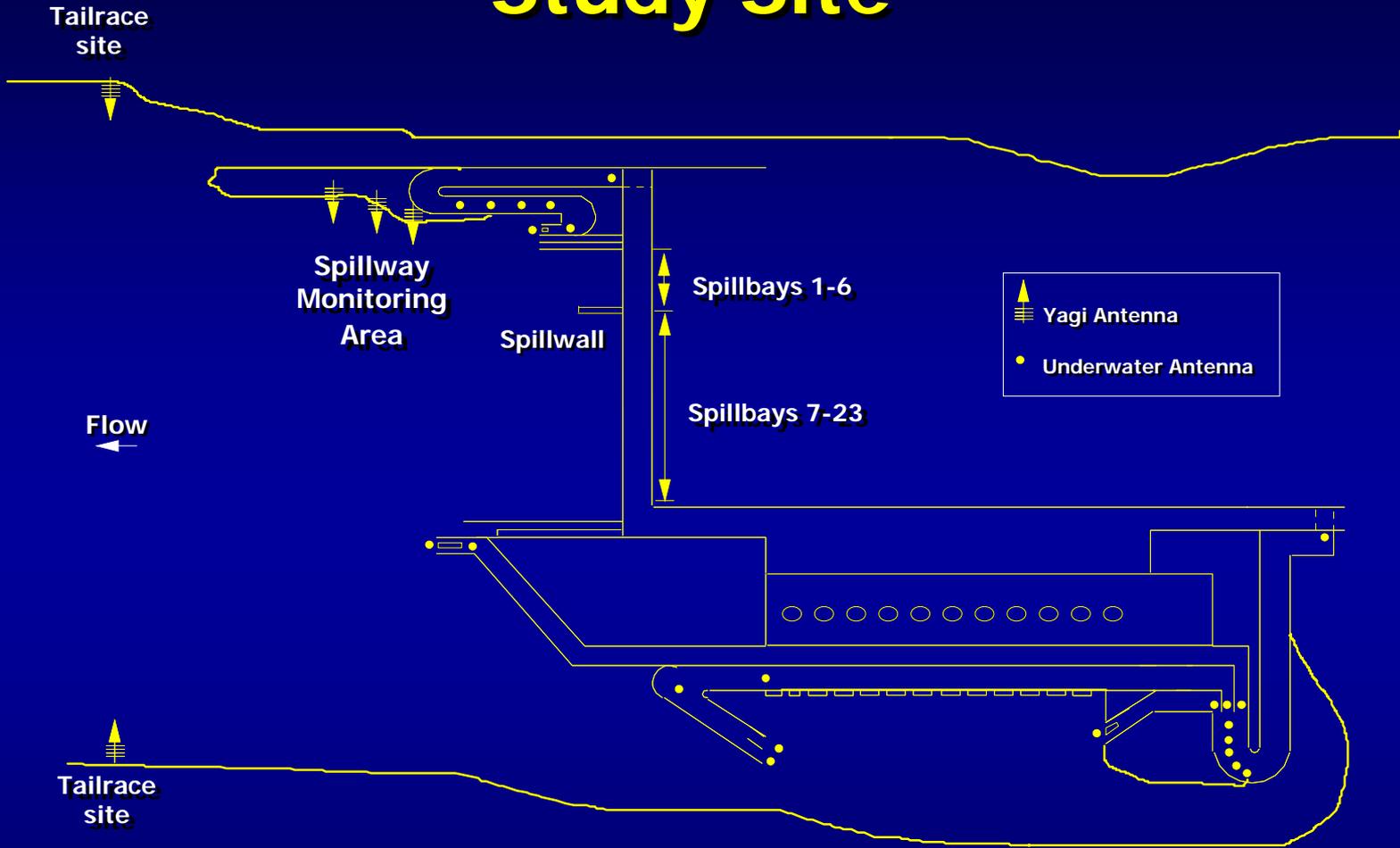
# Objective

- Evaluate whether a range of spill volumes discharged through spillbays 1-6 in 2007 slows dam passage by adult Chinook salmon.

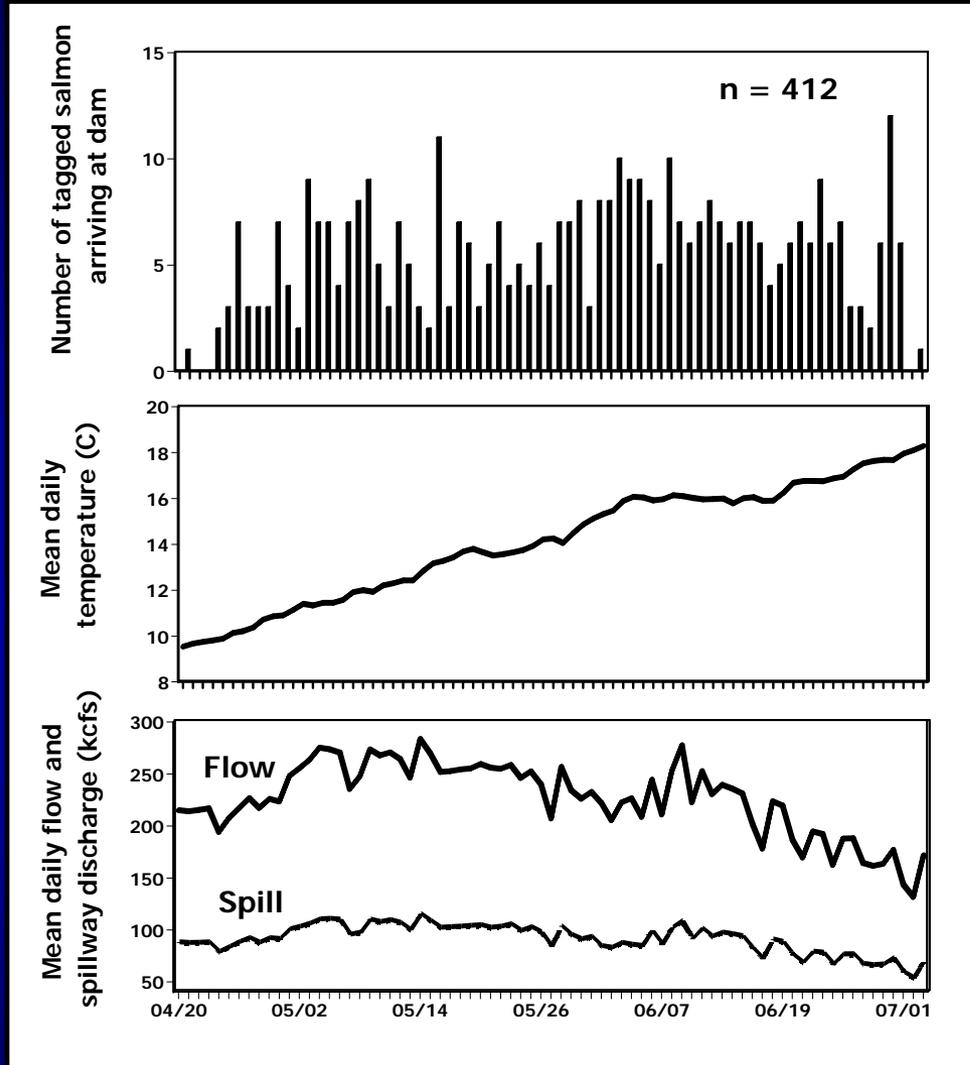
# Methods

- **Trap, radio-tag, and release 500 adult spring-summer Chinook salmon at Bonneville Dam**
- **Monitor movements of tagged fish at The Dalles Dam**
- **Use linear regression modeling to evaluate effects of spill volume on:**
  - **proportion of salmon passing via North ladder**
  - **tailrace residency time**
  - **total dam passage time**
- **Compare dam passage times among years**

# Study Site

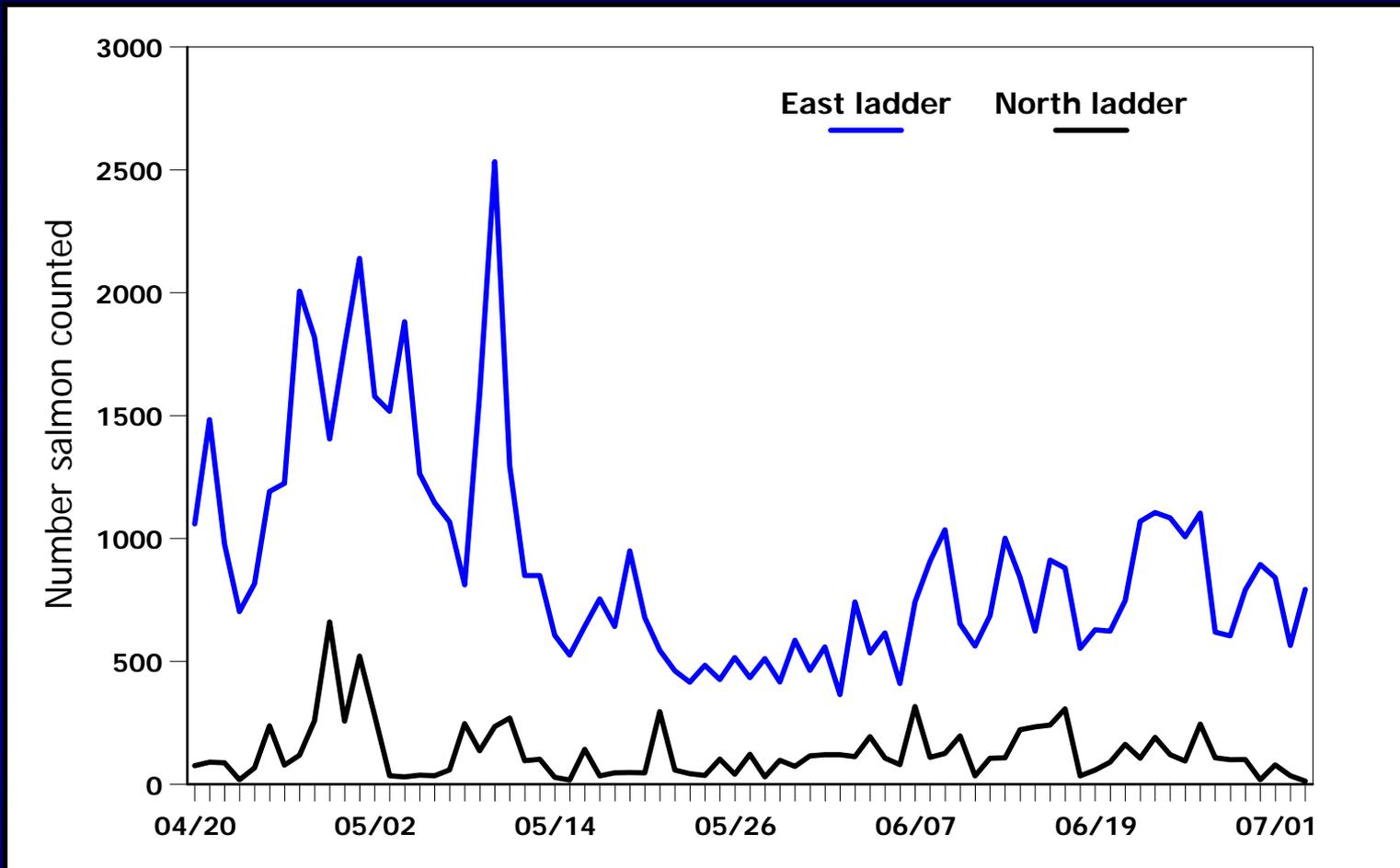


# Environmental Conditions and the Presence of Tagged Salmon



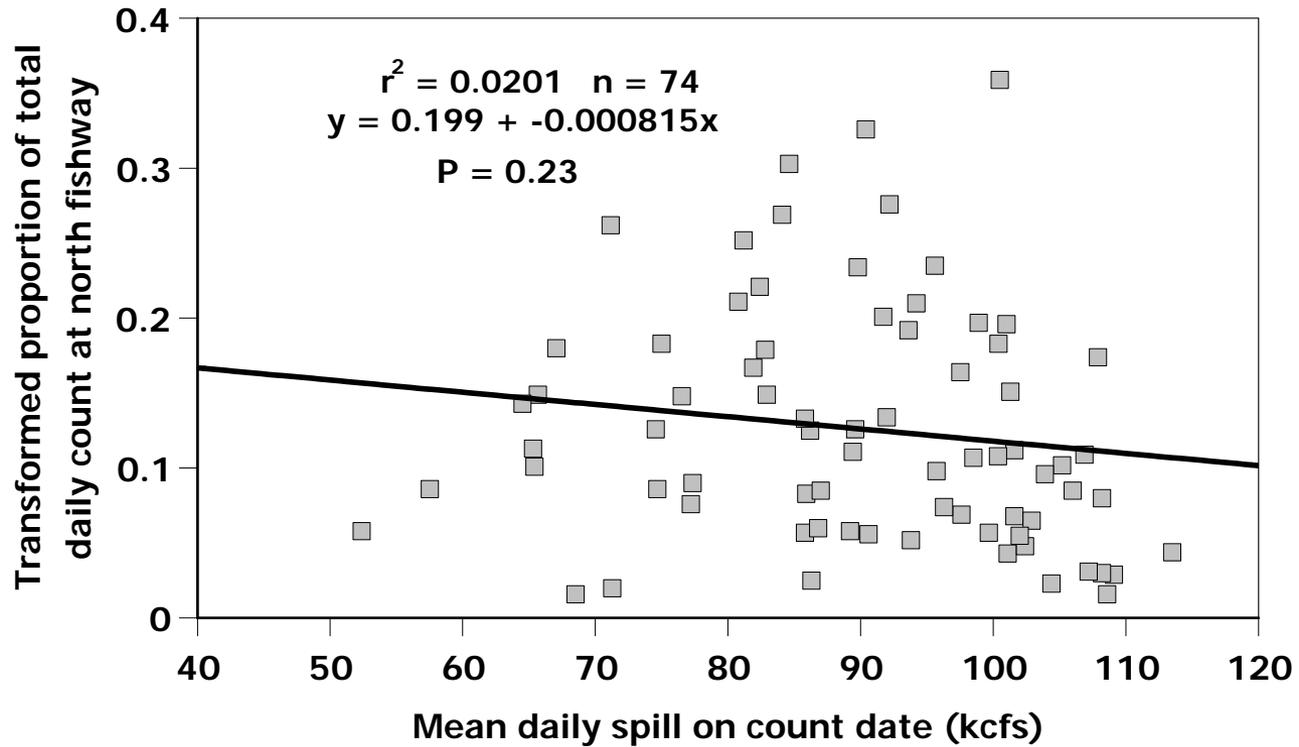
**Means:**  
Flow = 224 kcfs  
Spill = 89 kcfs  
% Spill = 40%

# Count Data - Use of North Ladder Was Low

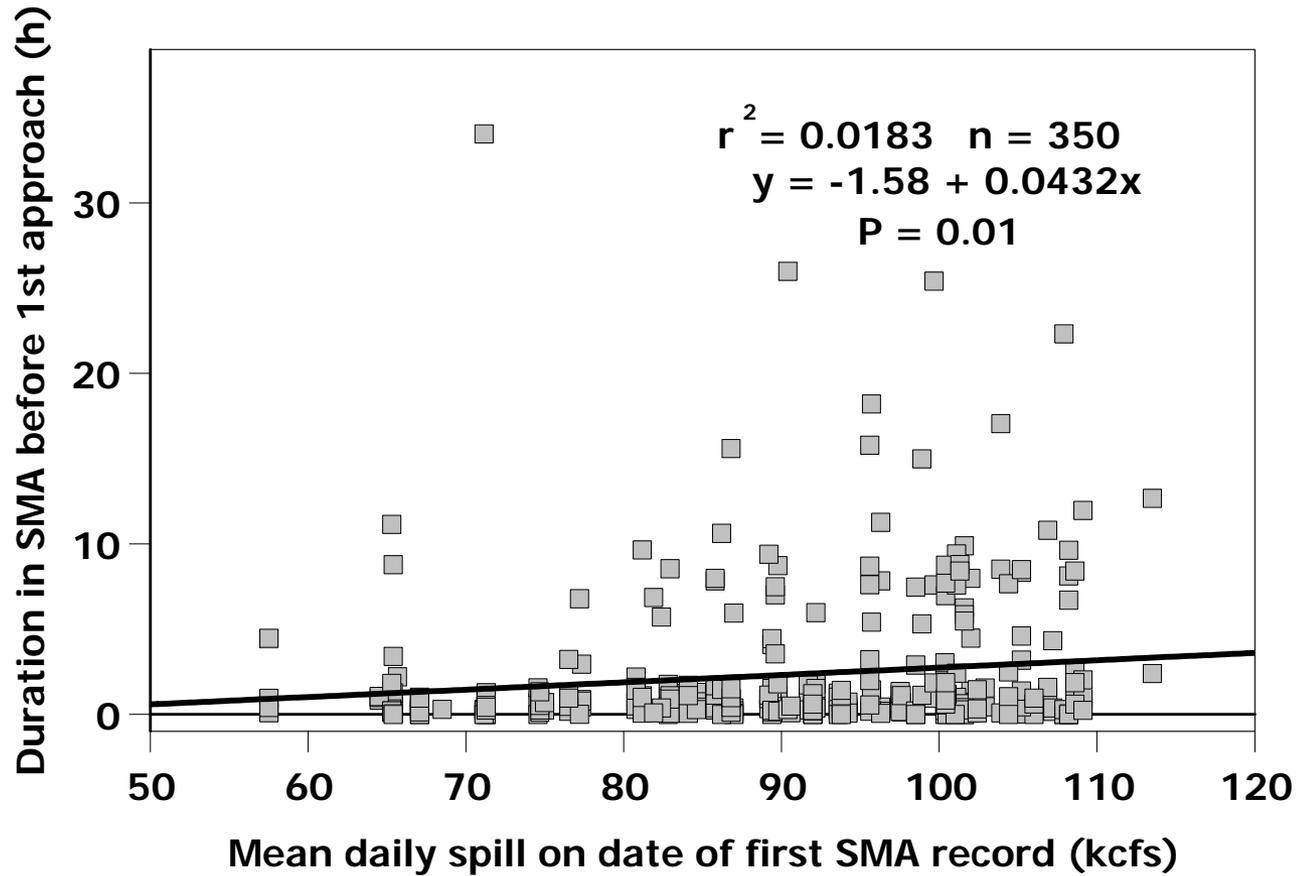


**13% of all adults counted passing dam were at North Ladder**

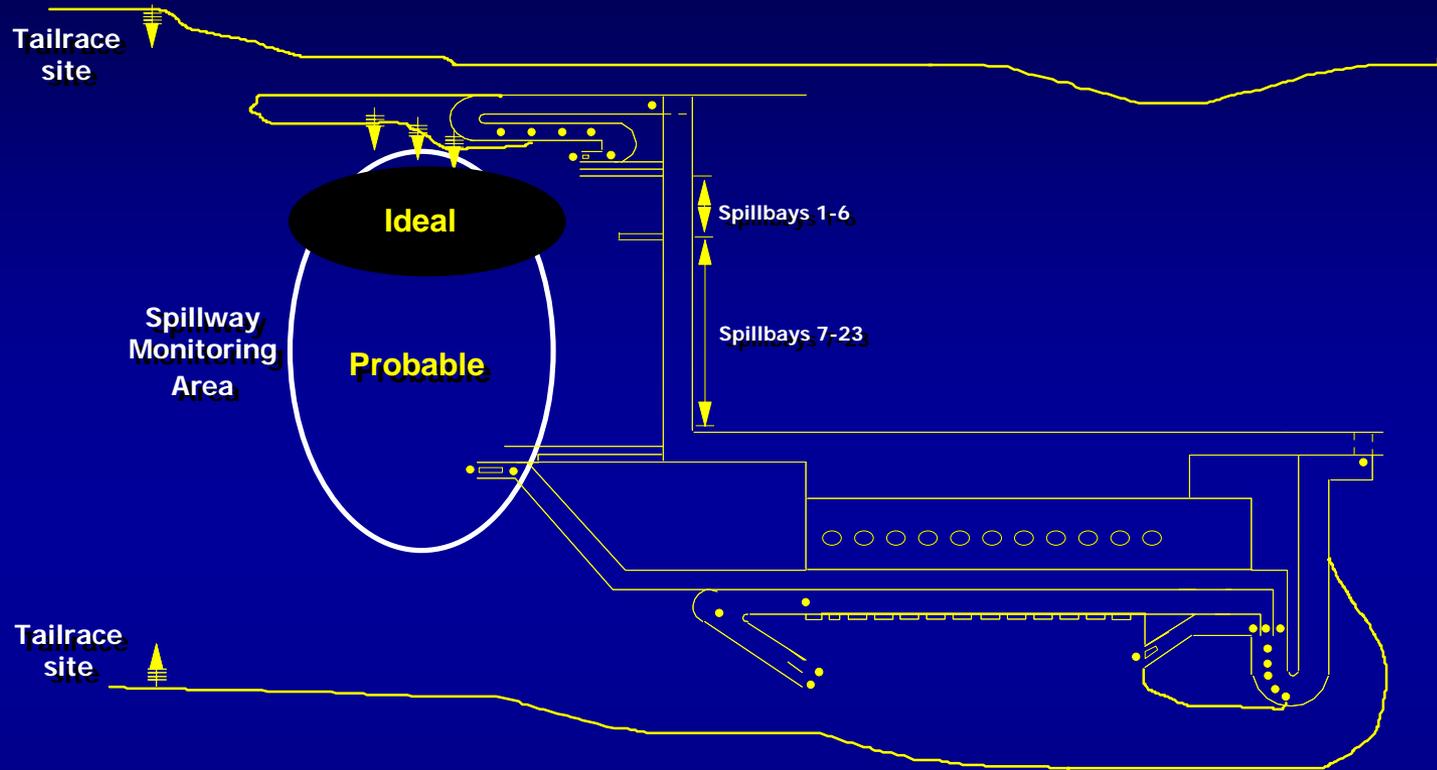
# Spill Volume vs. Proportion of Total Dam Count at North Ladder



# Spill Volume vs. SMA Residency Time

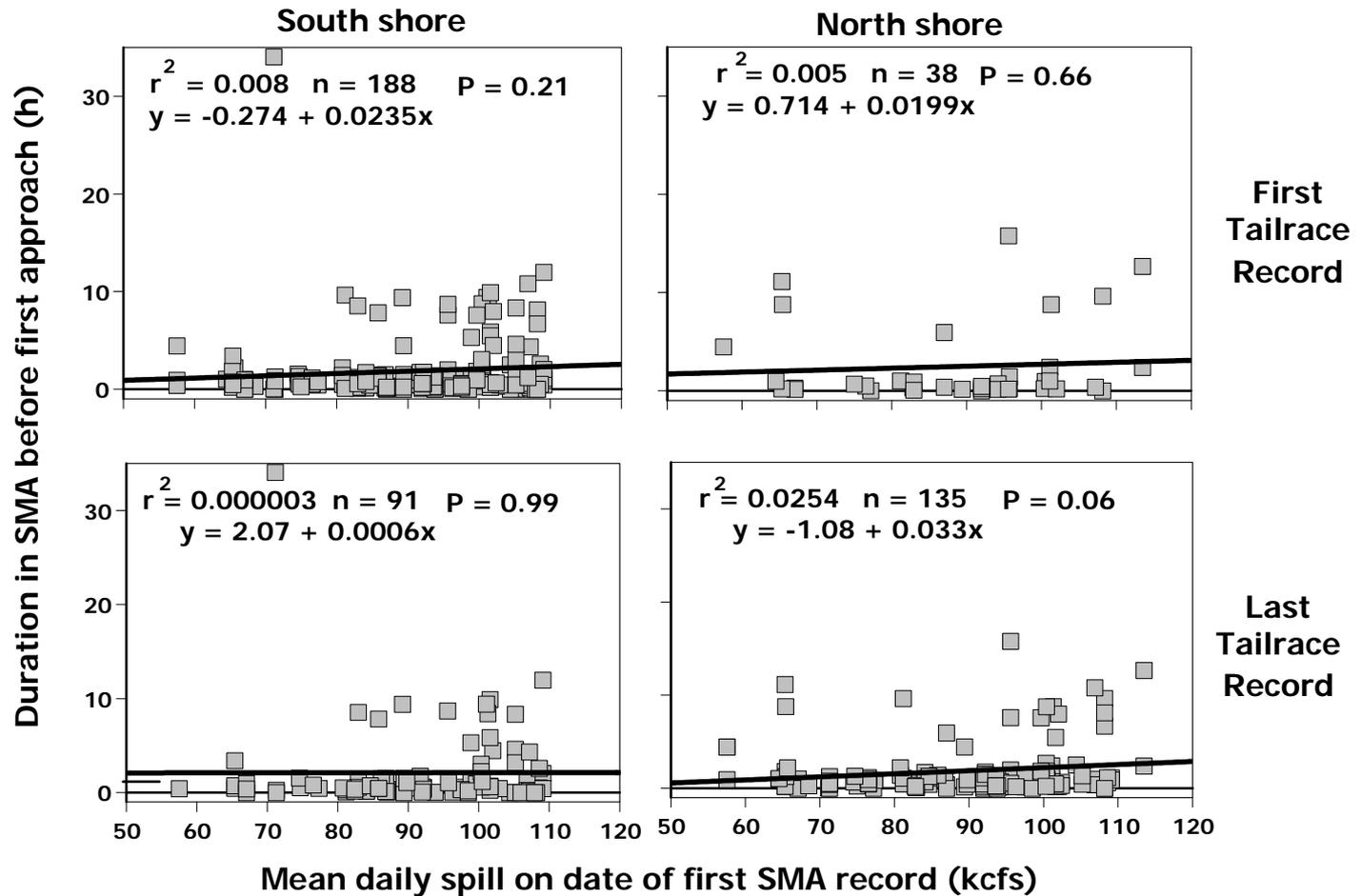


# Range of Detections for SMA Extended South Past Spillbays 1-6

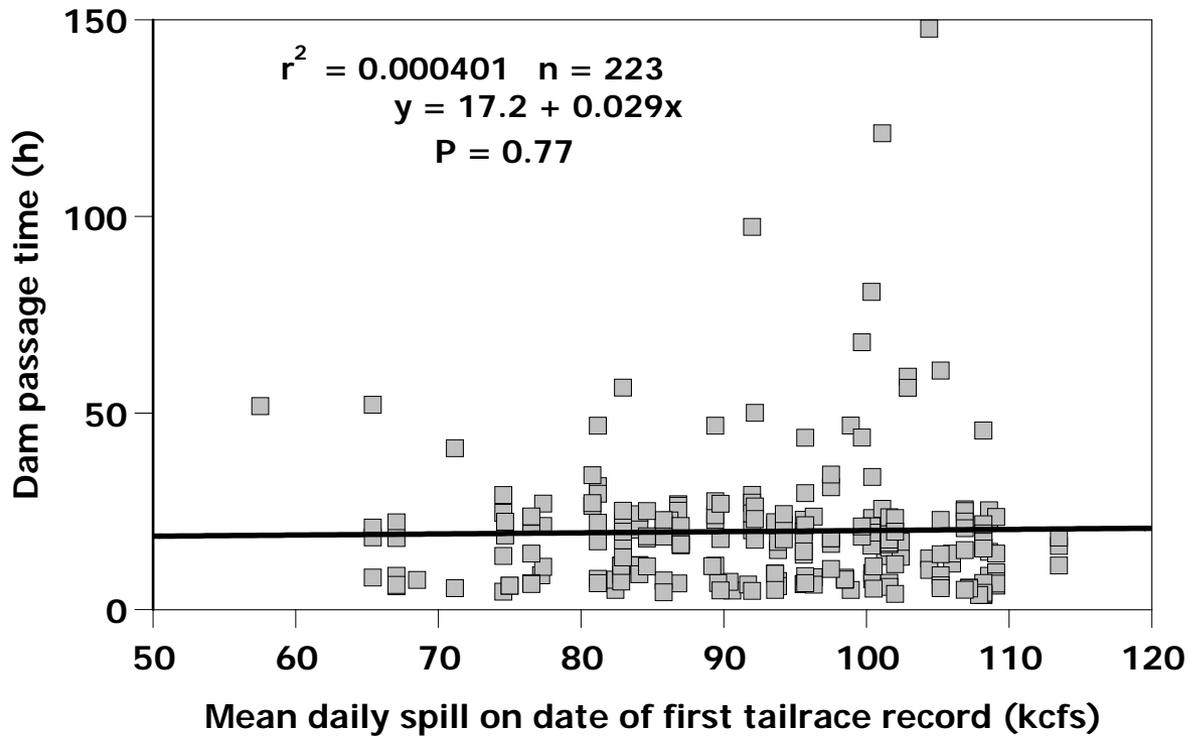


**Limited inferences re: behaviors downstream from bays 1-6**

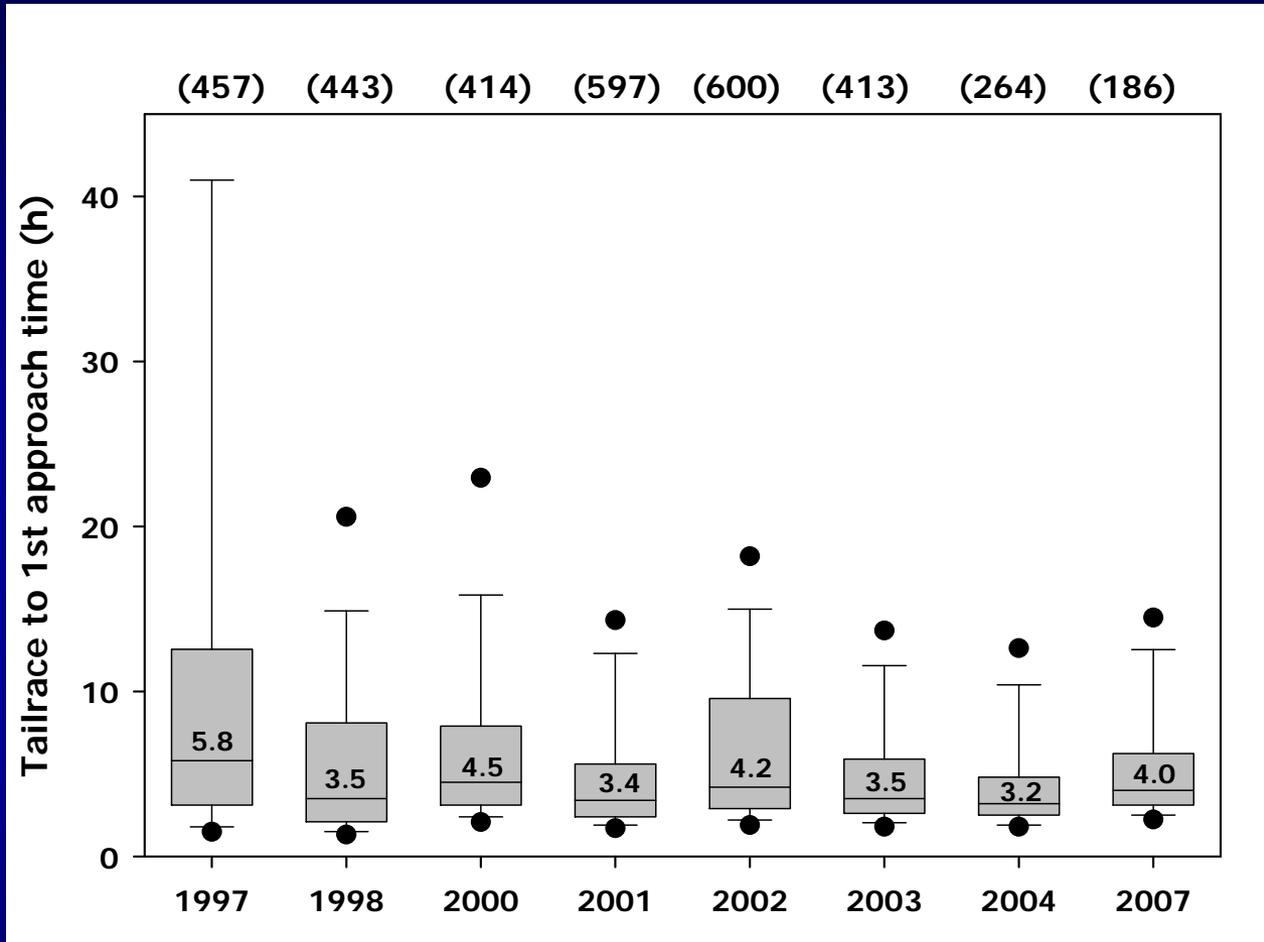
# SMA Residency Time based on First and Last Tailrace Records



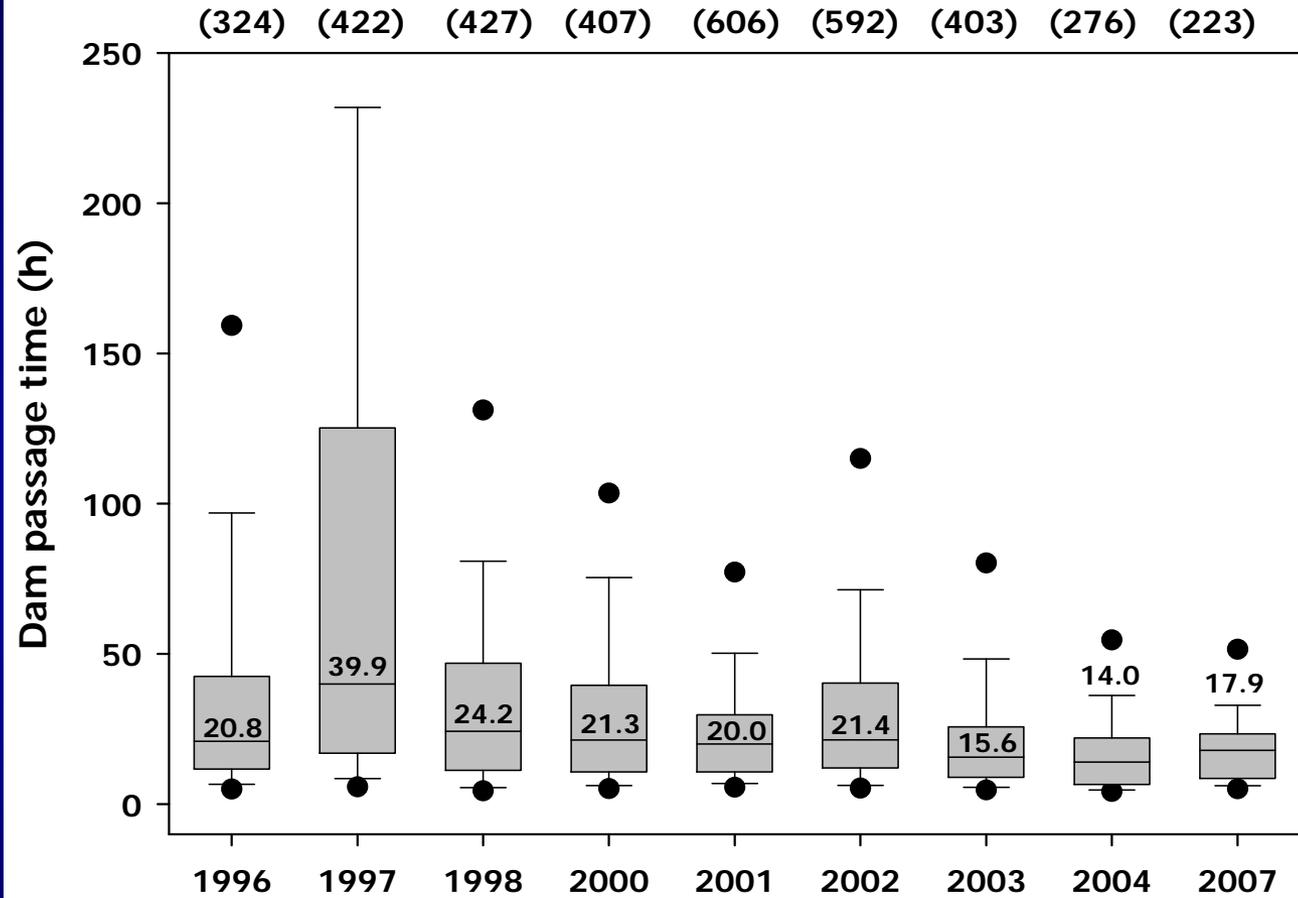
# Spill Volume vs. Total Dam Passage Times



# Inter-Annual Comparisons: Tailrace to First Approach Times



# Inter-Annual Comparisons: Dam Passage Times



# Conclusions

- As spill volume through bays 1-6 increases:
  - Tailrace residency likely to increase
  - Dam passage times likely to increase
  - Proportionate use of north ladder likely to decrease
- Based on inter-annual comparisons, passage of tagged adults was not slowed over range of spill volumes observed

**Questions?**