

Evaluation of adult salmon passage behavior in relation to fishway modifications at The Dalles and John Day Dams



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Outline

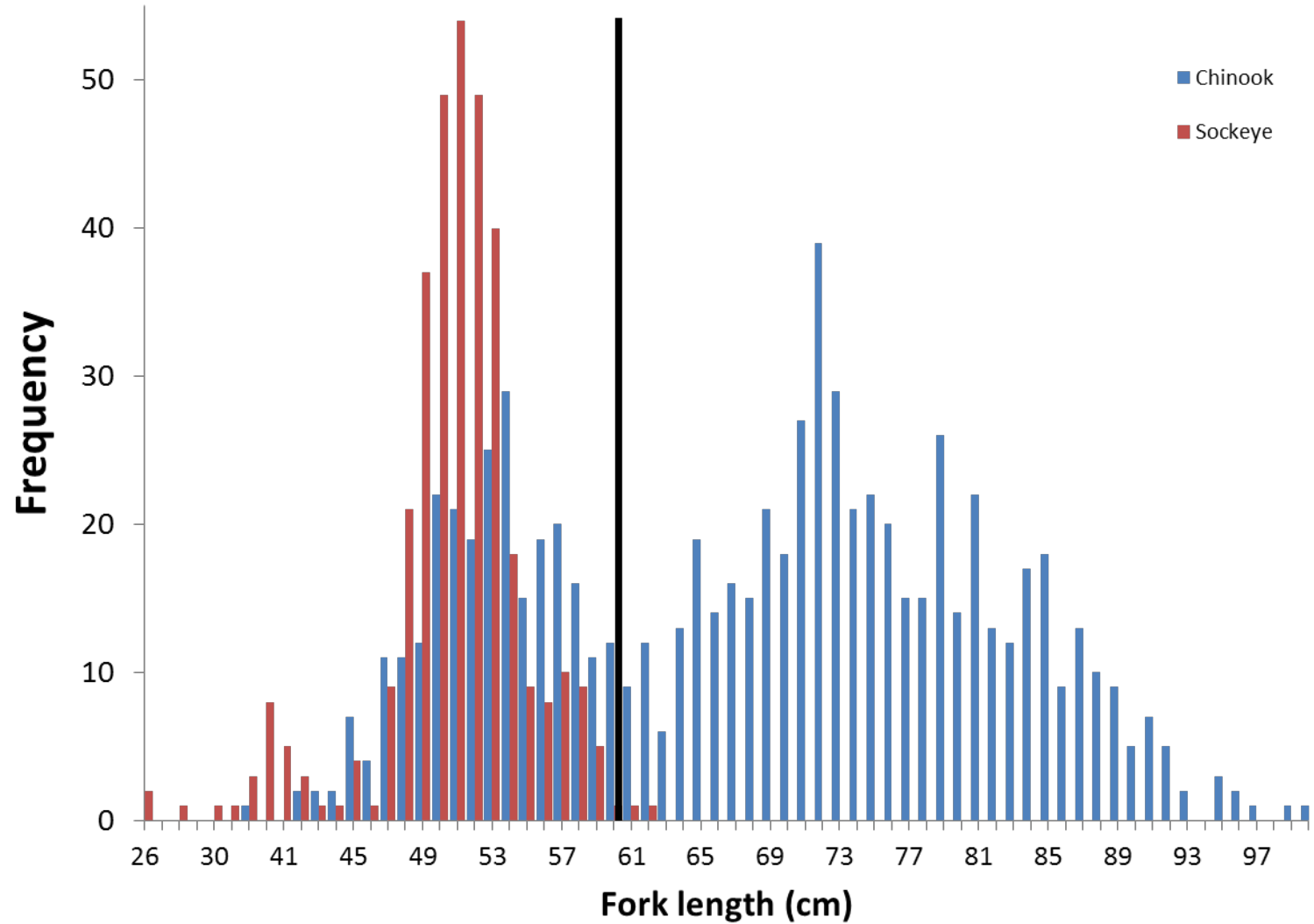
- The Dalles Dam
 - Ladder use
 - Side switching
- John Day Dam
 - Entrance efficiency and time

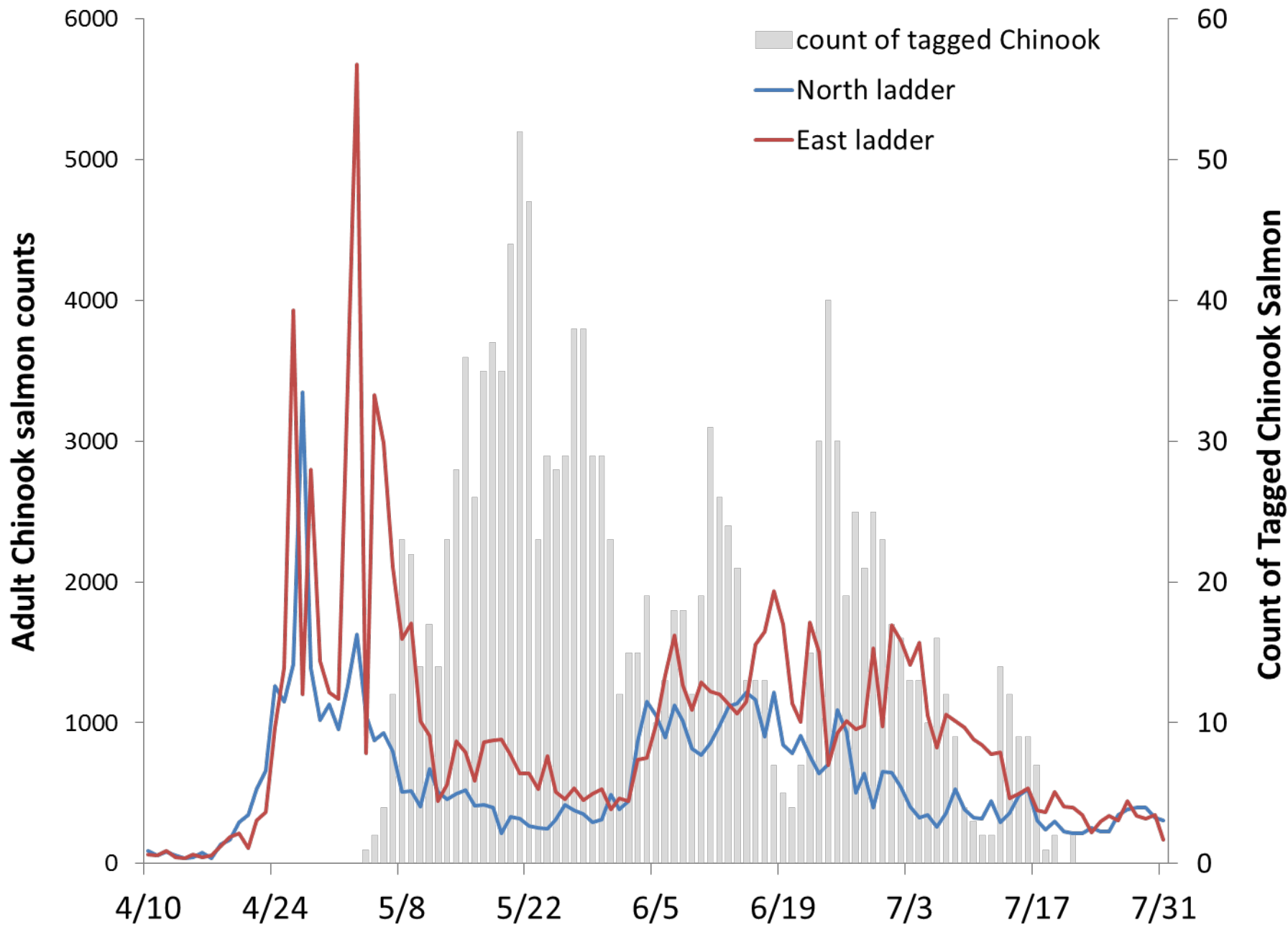


Are fish avoiding the North ladder?

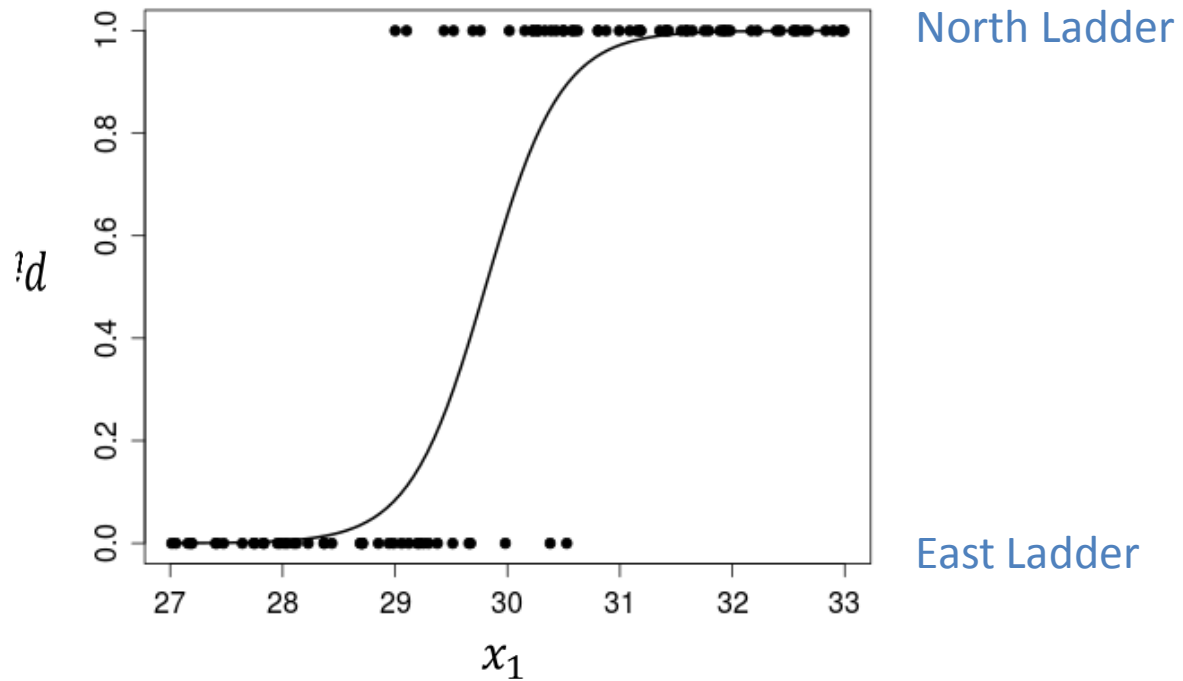
If so, is this related to spill, fish size, etc.?

Fork Length Distribution

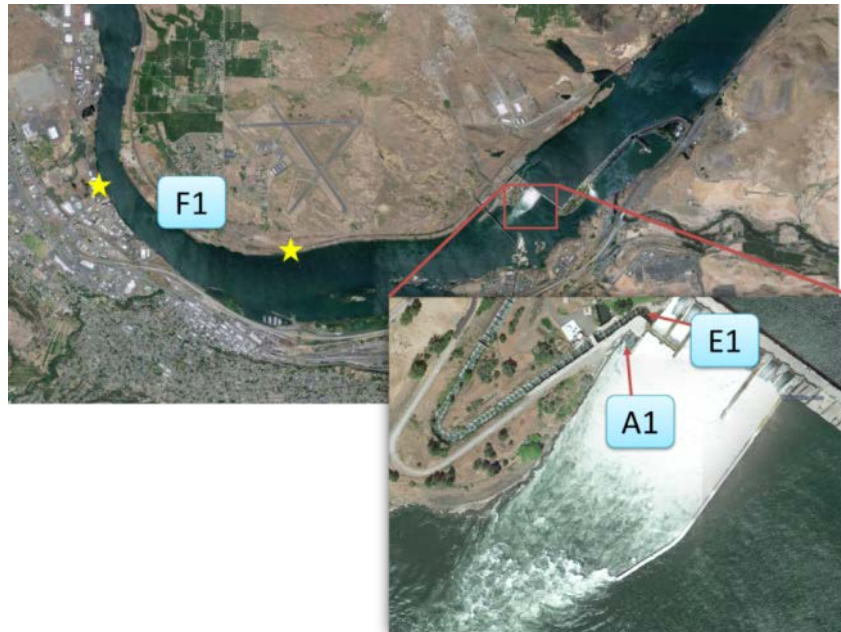
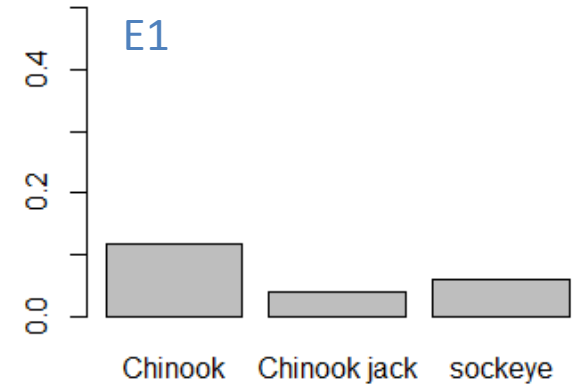
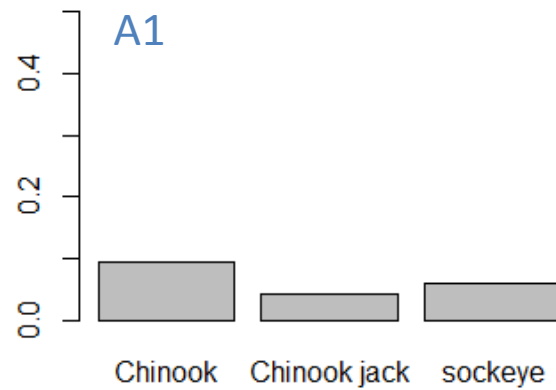
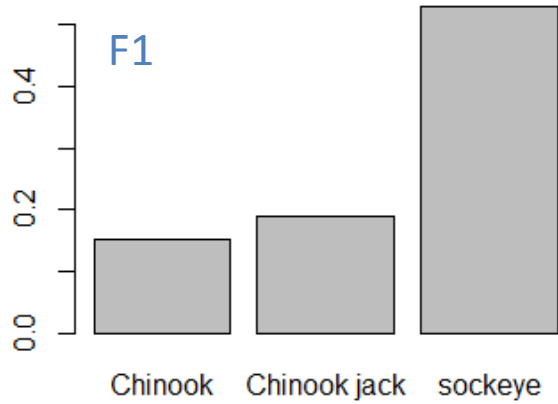




Logistic Regression



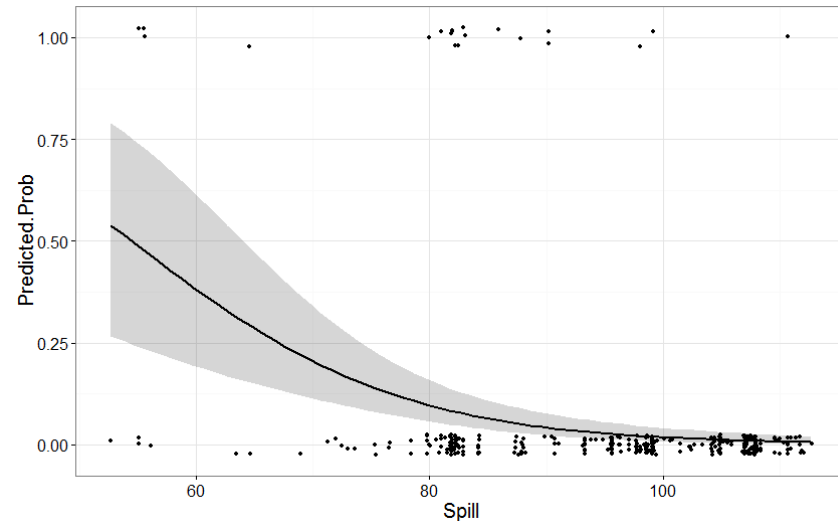
Probability of Using the North Shore/Ladder

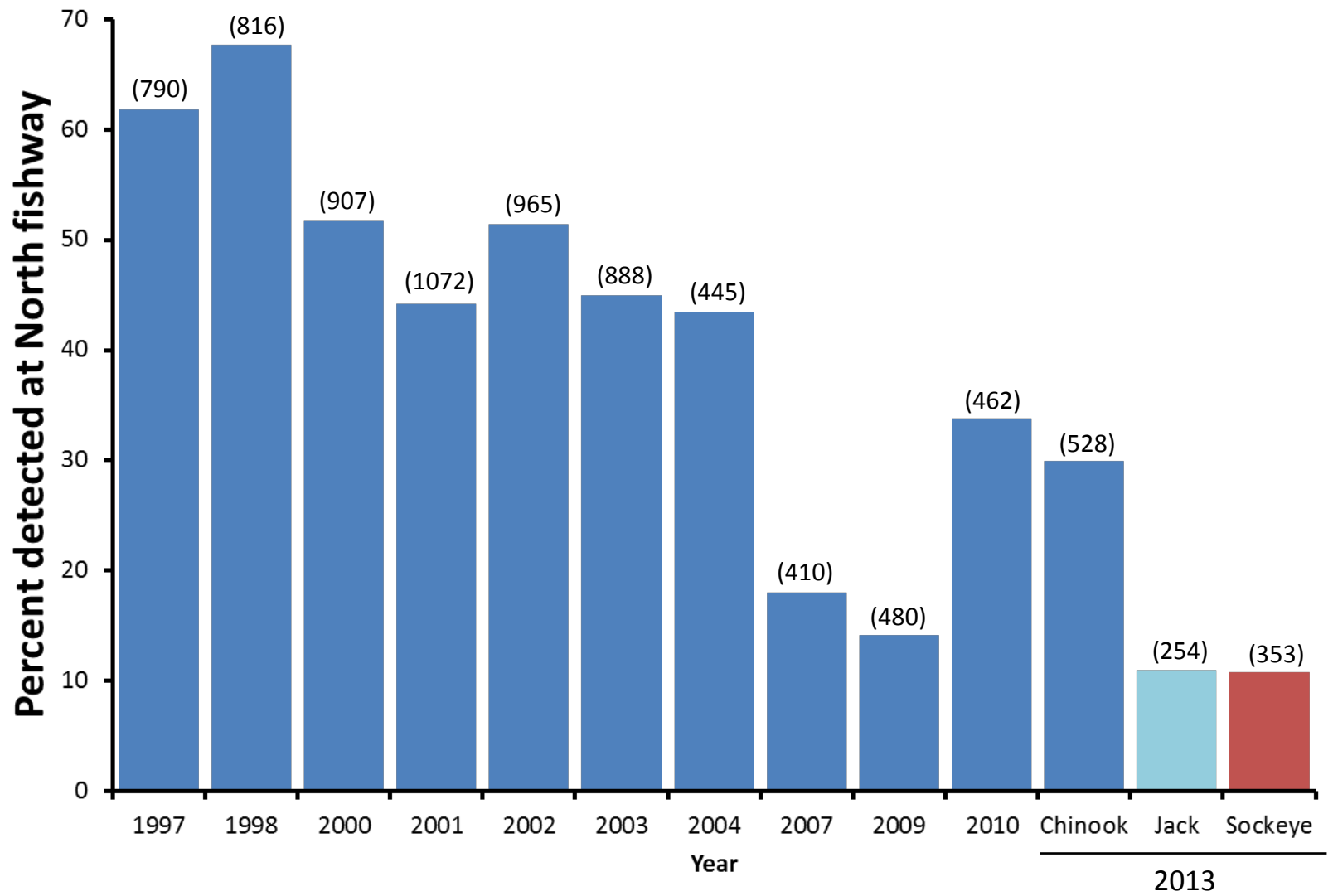


Probability of Using the North Shore/Ladder

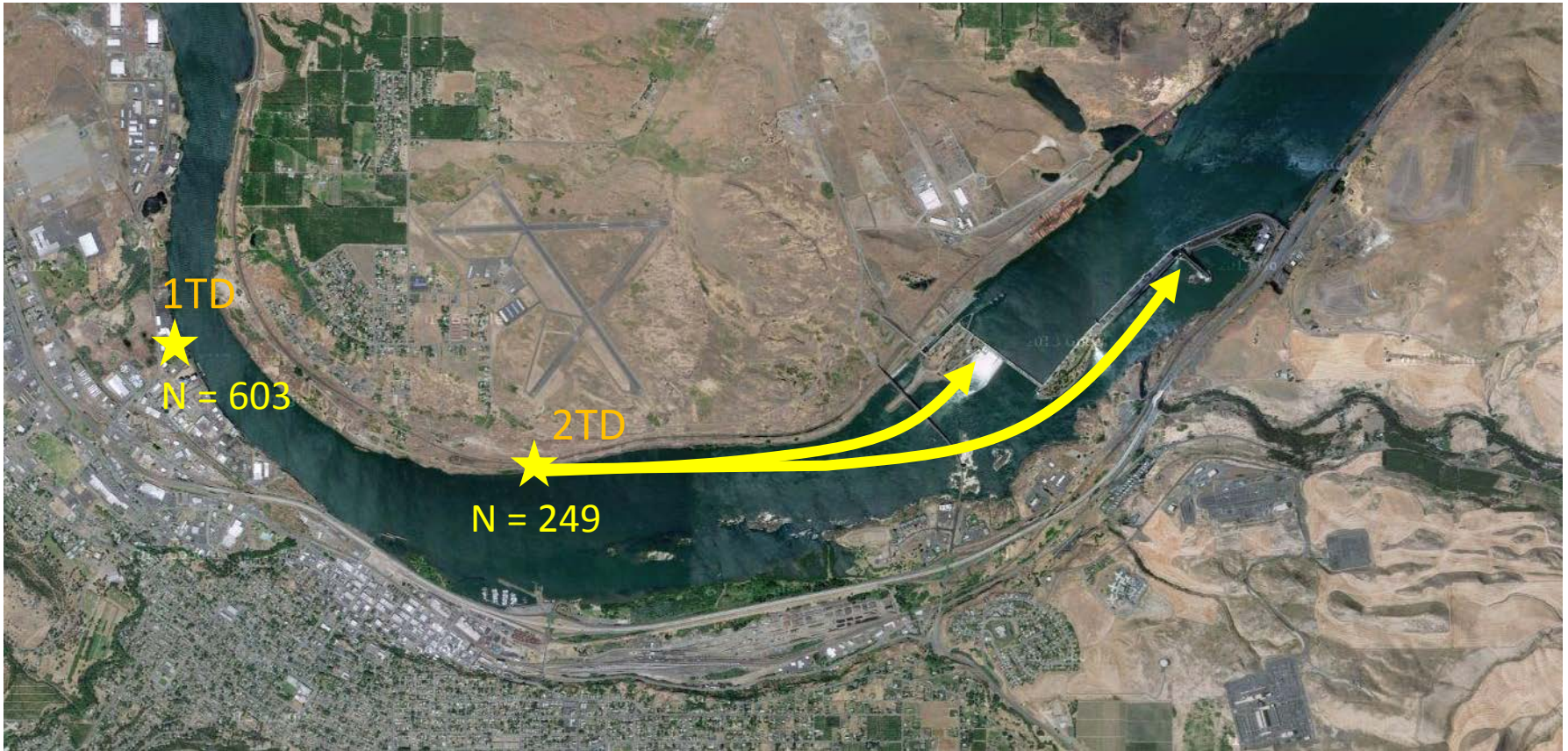
	Chinook	Ch. Jacks	Sockeye
F1 Length (cm)	+5%	-	+6%
Date (d)	+13%	+3%	-7%
Temperature (°C)	-42%	-	+162%
Spill (kcfs)	-	-	-
Flow (kcfs)	+2%	-	+3%
Dis. Gas (mmHg)	-	-	-
A1 Length	+4%	-	+21%
Date	-	-	-
Temperature	-	-	-
Spill	-2%	-6%	-8%
Flow	-	-	-
Dis. Gas	-	-	-
E1 Length	+4%	-	+21%
Date	-	-	-
Temperature	+20%	-	-
Spill	-	-	-
Flow	-	-	-4%
Dis. Gas	-	-7%	-

A1 for Sockeye



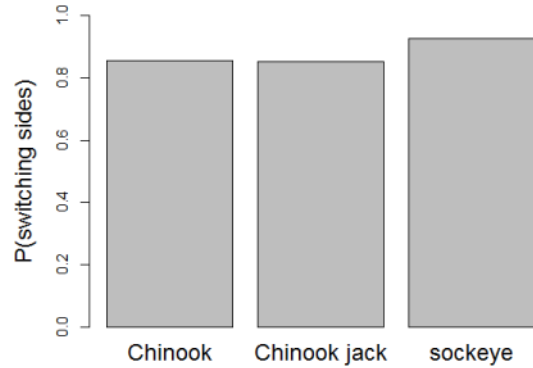


Side Switching



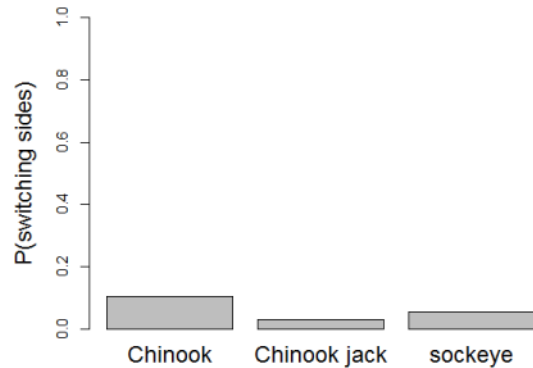
Logistic Regression

Probability of Switching Sides Between F1 and E1



F1 in **Washington**

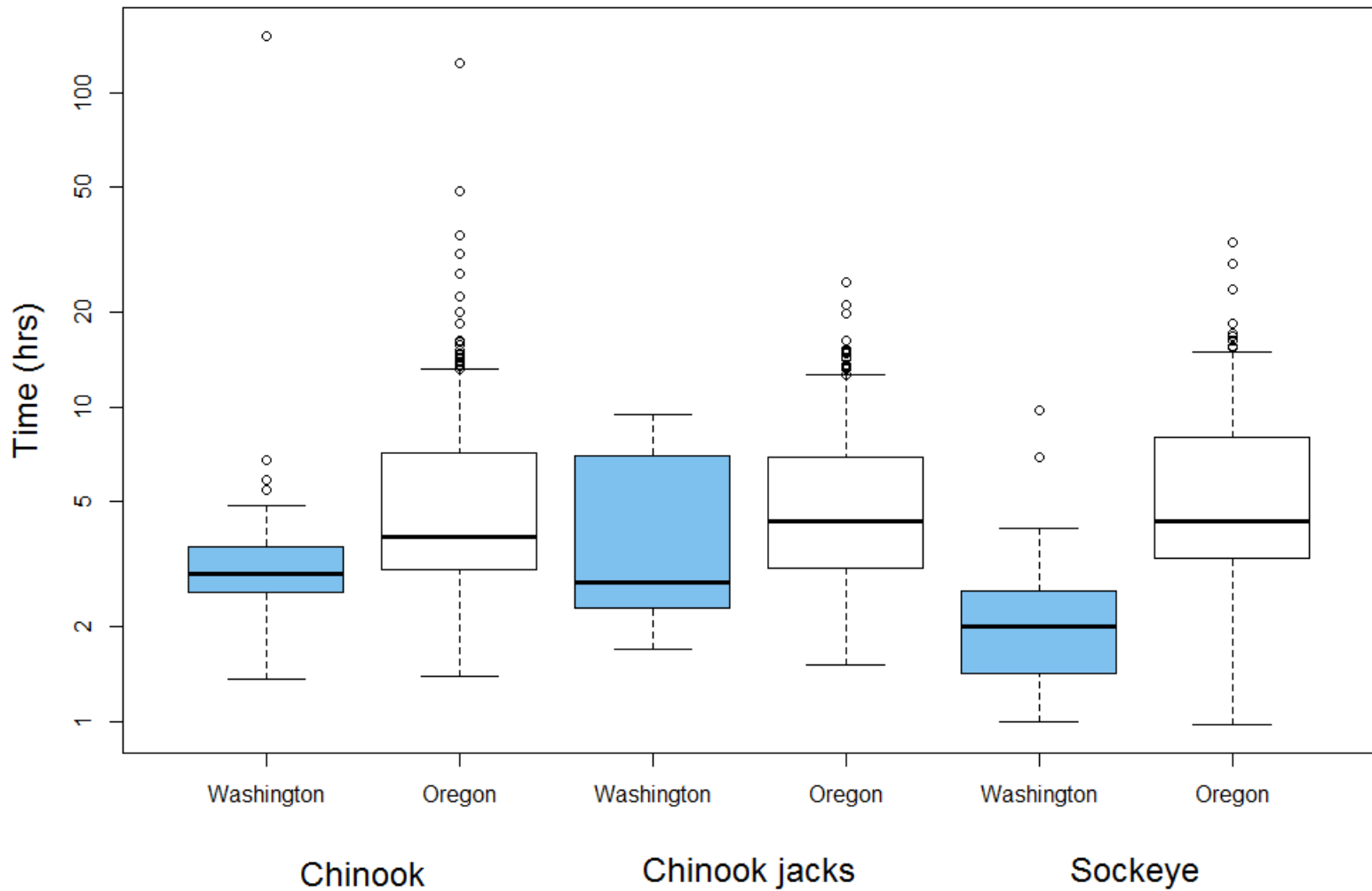
	Chinook (55)	Ch. Jacks (34)	Sockeye (160)
Length	-	-	-39%
Date	-	-	-
Dis. Gas	-	-	+7%
Temperature	-	-	-
Spill	-	+8%	-
Flow	-	-	-



F1 in **Oregon**

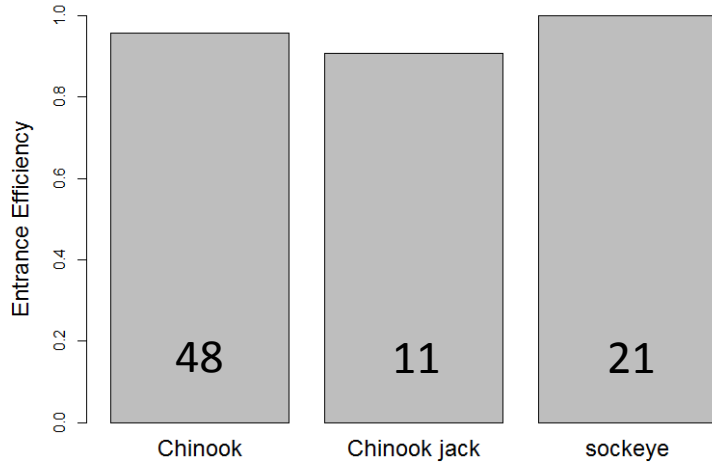
	Chinook (296)	Ch. Jacks (142)	Sockeye (144)
Length	-	-	-
Date	+3%	-	-
Dis. Gas	-	-	-
Temperature	-	-	-
Spill	-	-6%	-12%
Flow	-	-	-

Travel time from F1 to A1

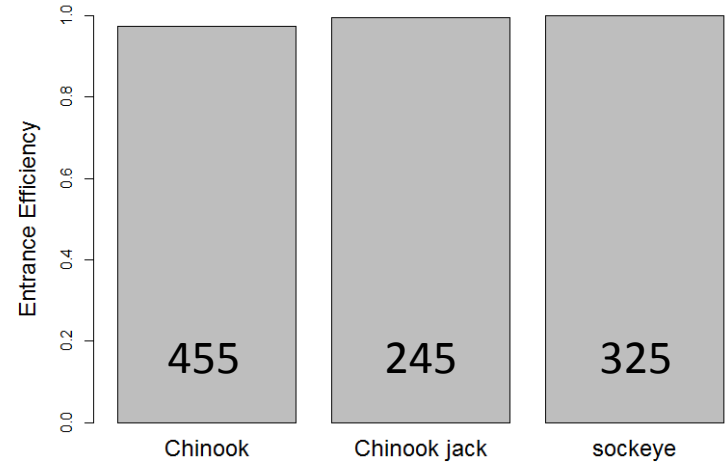


Entrance Efficiency

North Ladder



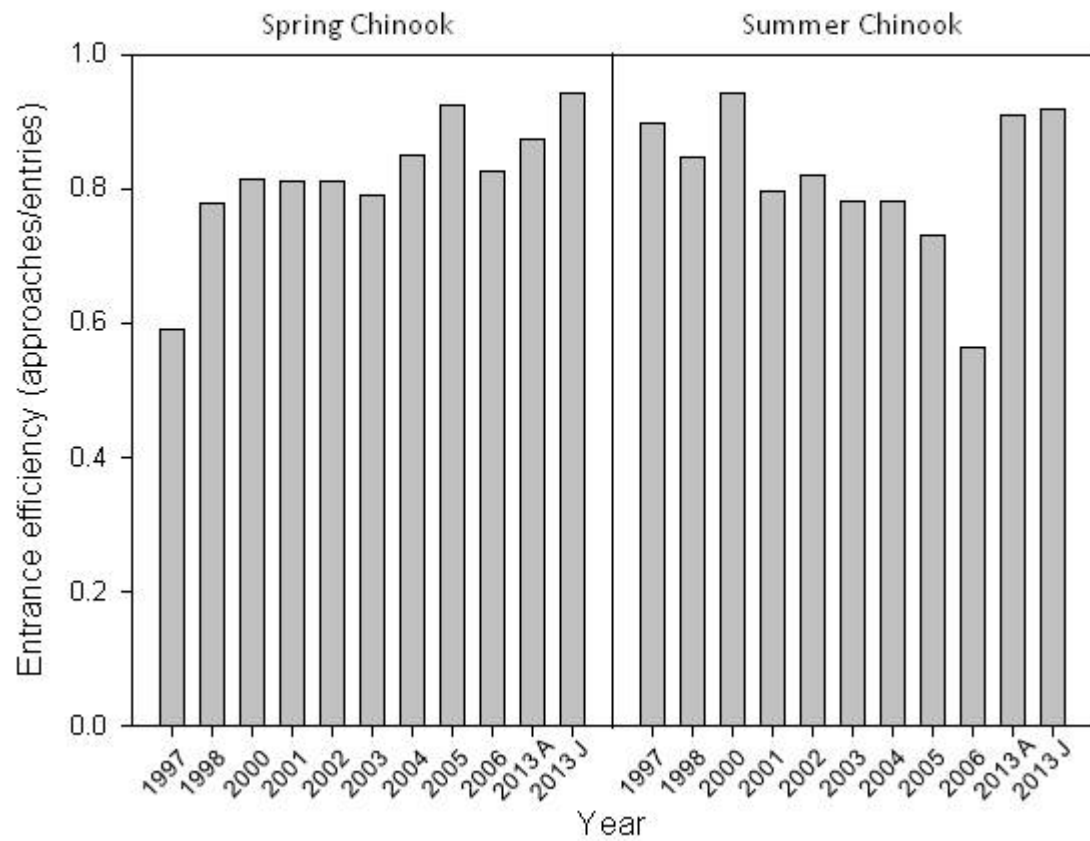
East Ladder



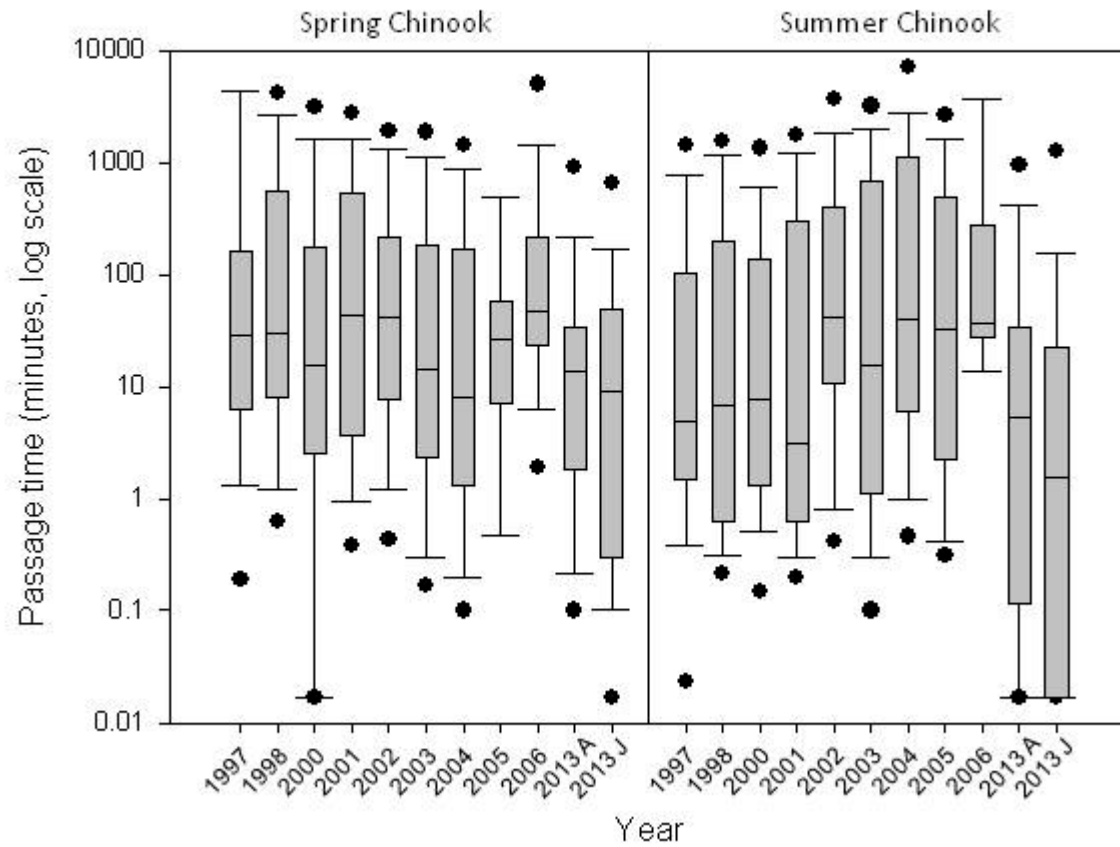
John Day Dam



JD-North Entrance Efficiency



JD-North passage time: first approach to first entry



Summary

- The Dalles
 - Most Chinook use the south side of the river (downstream of The Dalles Dam)
 - Larger fish use the North side more than small fish
 - All are less likely to approach the North with higher spill
 - Fish switch sides – influenced by spill (jacks)
 - Approaching the North does not cause significant delays
- John Day
 - Entrance efficiency and entrance time look good (may have improved?)