

# Subyearling Chinook Survival in Lower Granite Dam to McNary Dam reach in 2006 compared to years 1998 to 2005

## Preliminary Analysis

FPC

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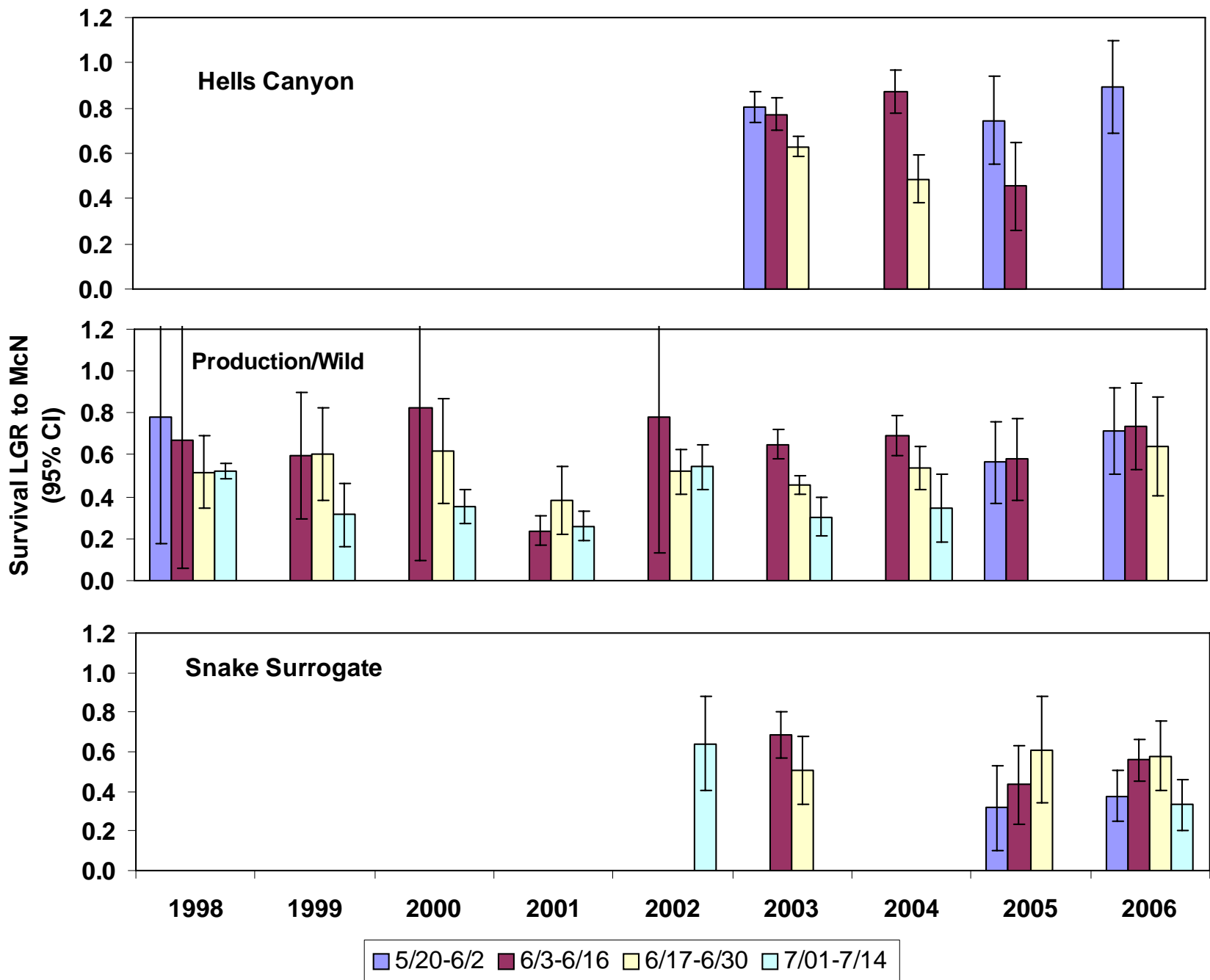
- Show 2006 survival estimates in relation to other recent years
- Compare Survival and Travel Time in the reach LGR to McNary in relation to environmental variables (Spill, WTT, Flow, Temp)
- Discuss appropriateness of CJS in reach survival estimation for subyearling chinook salmon in the Snake River

# Survival Estimation methods

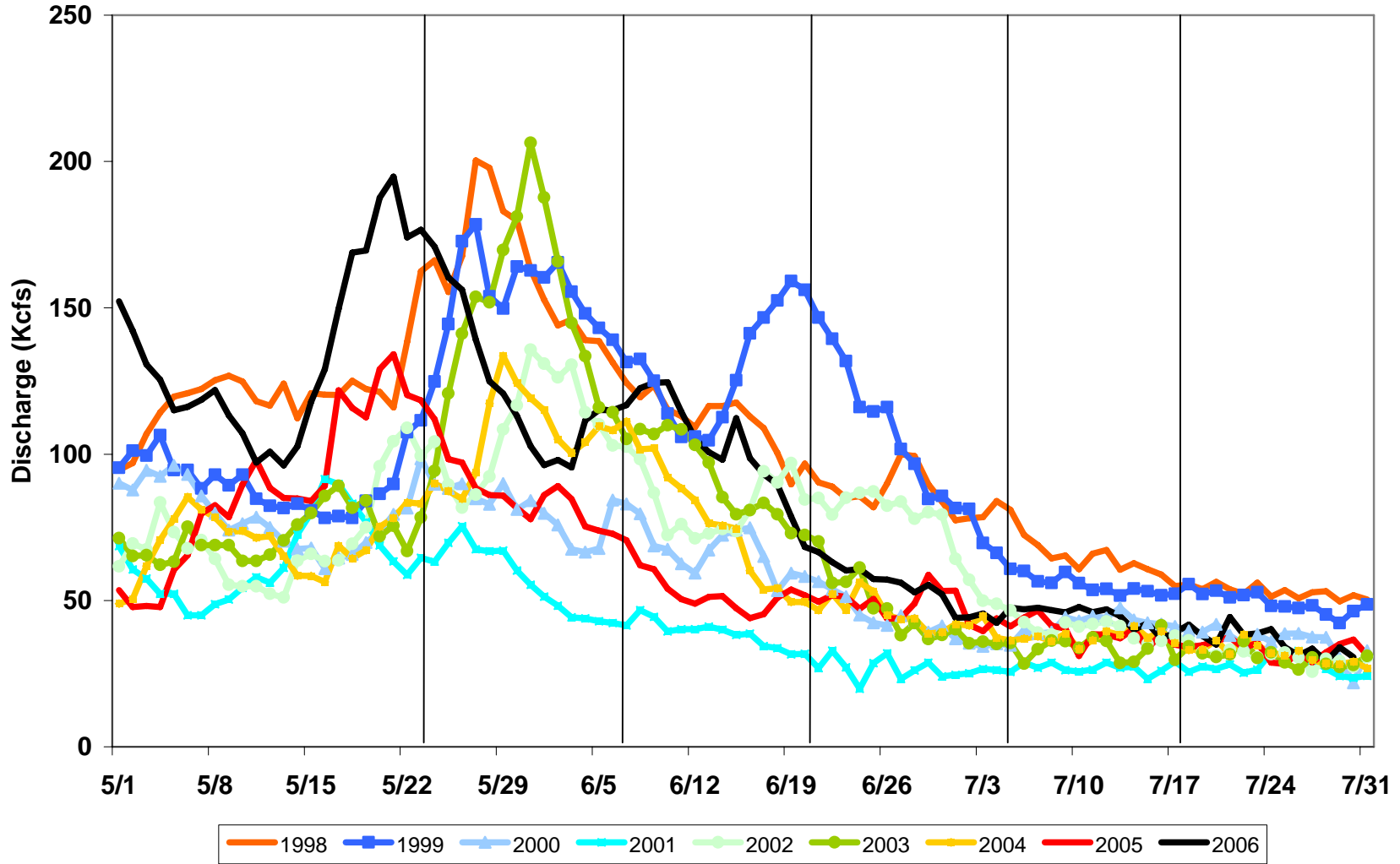
- Estimate Survival for various PIT-tagged subyearling chinook detected at LGR during four time periods
  - 5/20 to 6/2
  - 6/3 to 6/16
  - 6/17 to 6/30
  - 7/1 to 7/14
- Estimate Travel Time from LGR to McN and assign environmental variables (Avg Spill, Flow, WTT, Temp) based on passage timing through the reach for each group
- Remove 'holdover' detects from capture histories to remove potential source of bias in reach survival estimates

# PIT-tag release groups used in analysis

- **Production/Wild-(acclimation, hatchery and wild releases) includes release sites PLAP, CJRAP, BCCAP, NPTH, CEFLAF, Couse Creek and Snake River wild releases (WPC 15W)**
- Not included--late season releases from BCCAP (Clearwater Surrogates), Clearwater wild marks, nor early season yearling fall chinook releases from acclimation facilities
- Analyzed and subsequently removed from multi-year analysis -- Hells Canyon Dam-PIT-tags released with Oxbow Hatchery release, Snake Surrogate – DMM SNAKE3 and SNAKE4



# Avg Discharge LGS 1998 to 2006

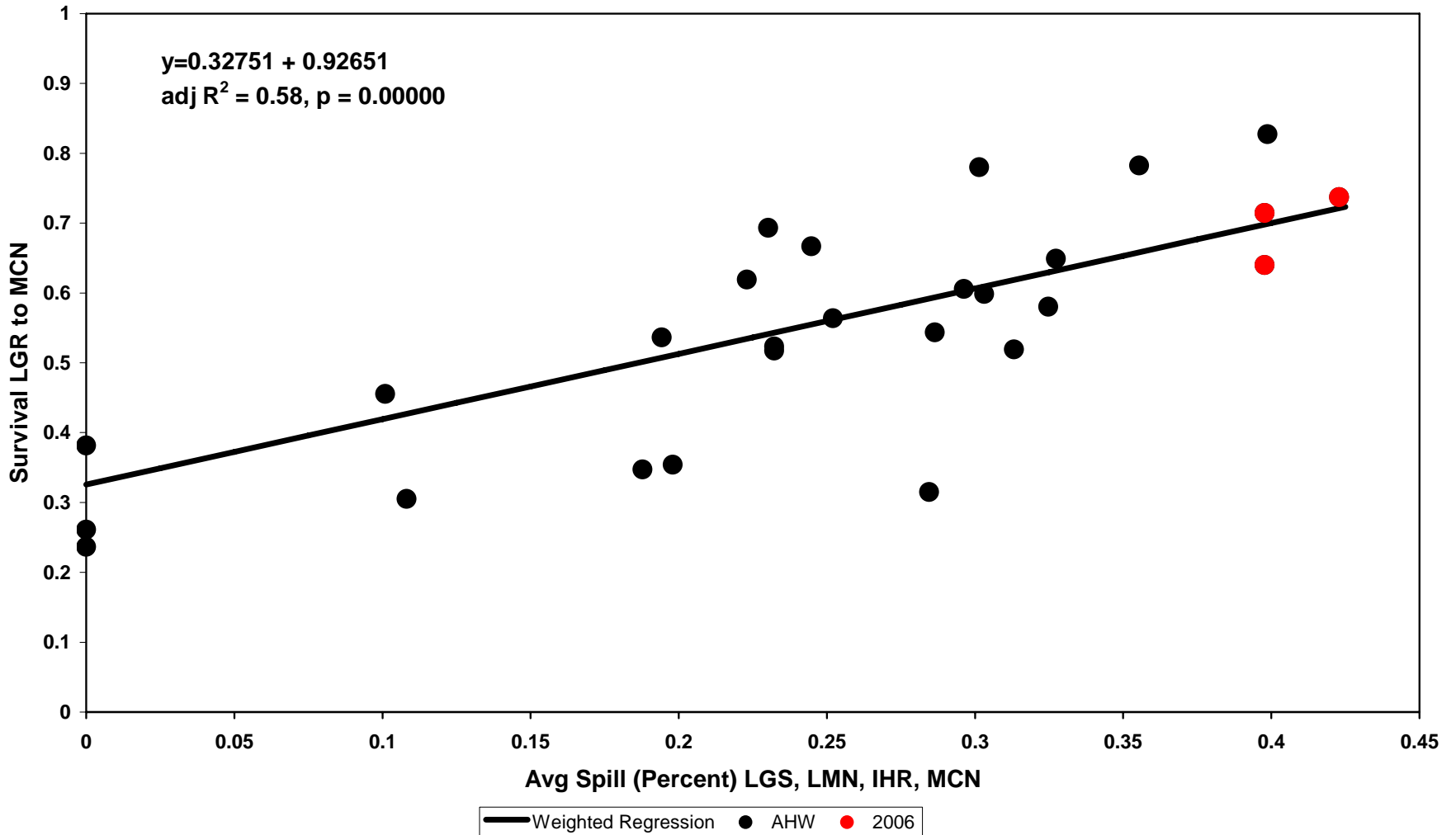




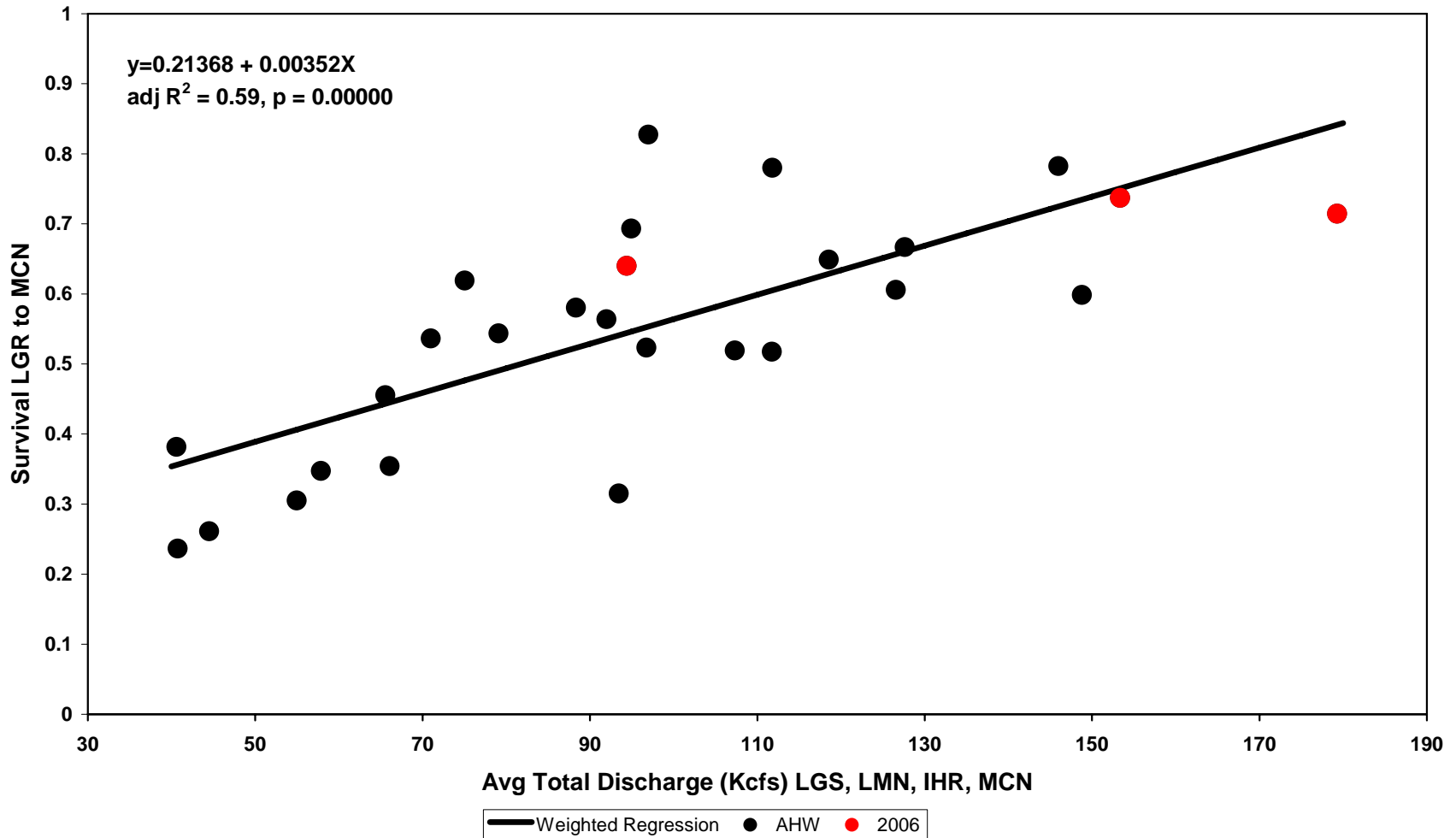




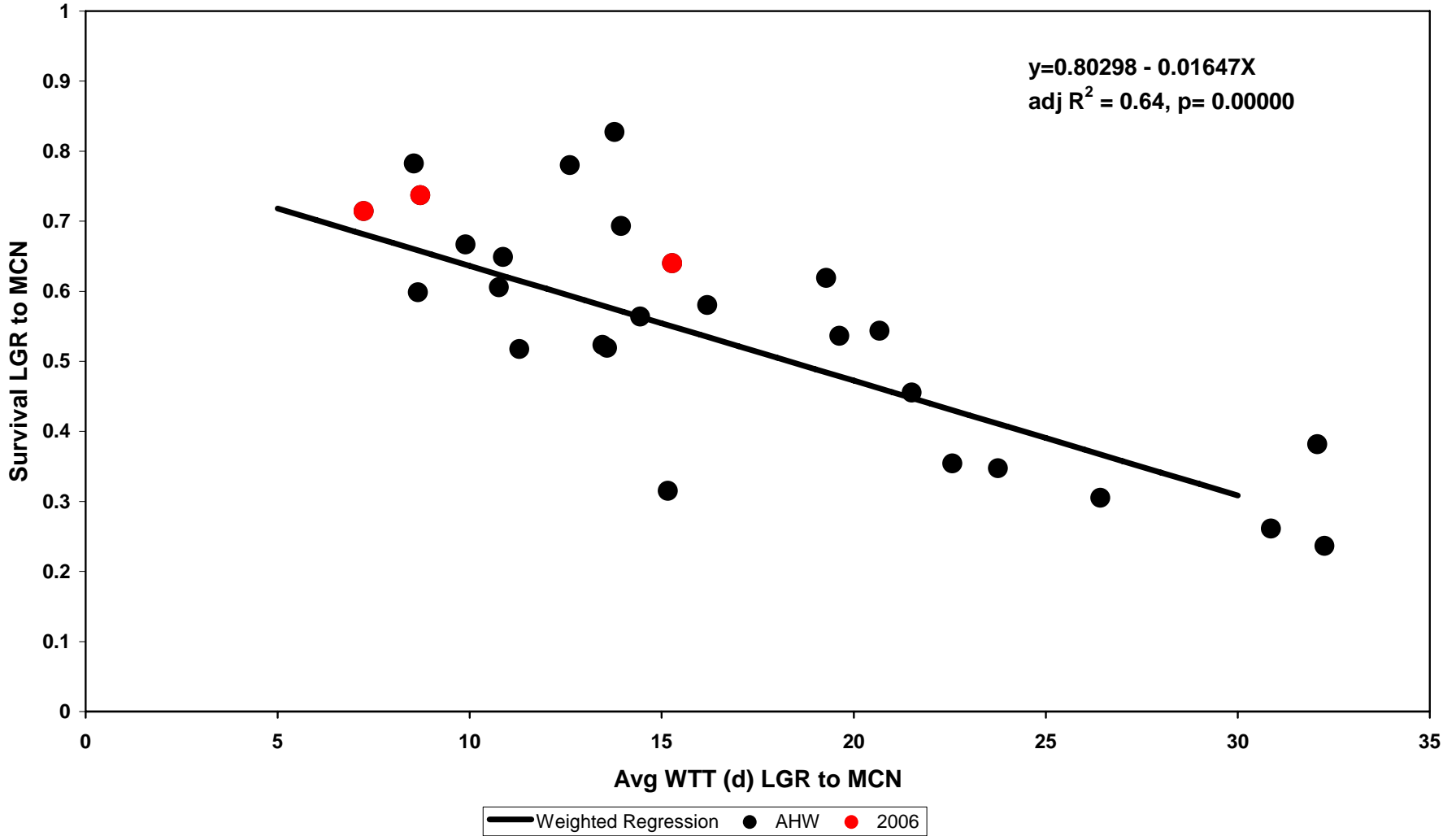
# Survival versus Avg Spill



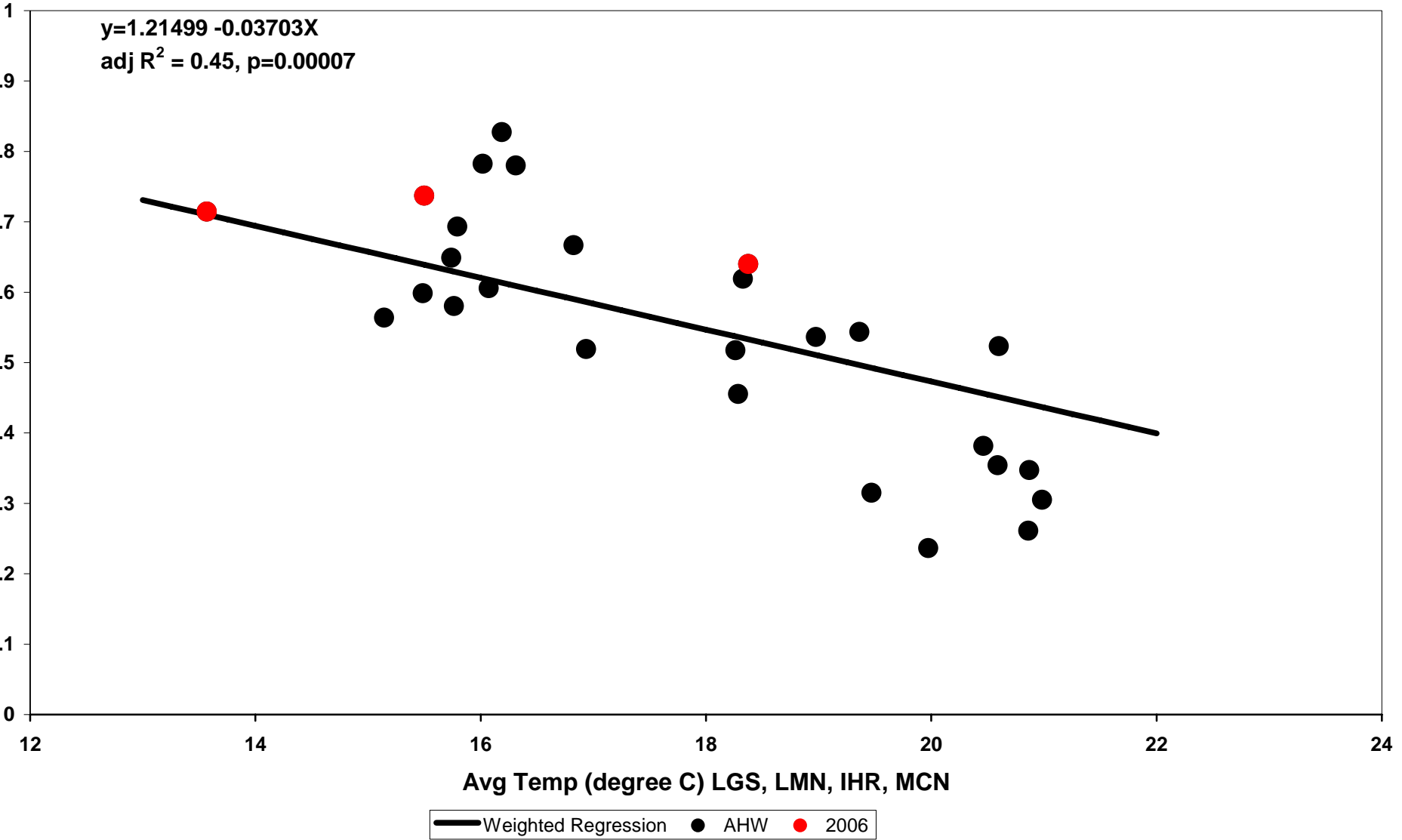
# Survival versus Avg Total Discharge



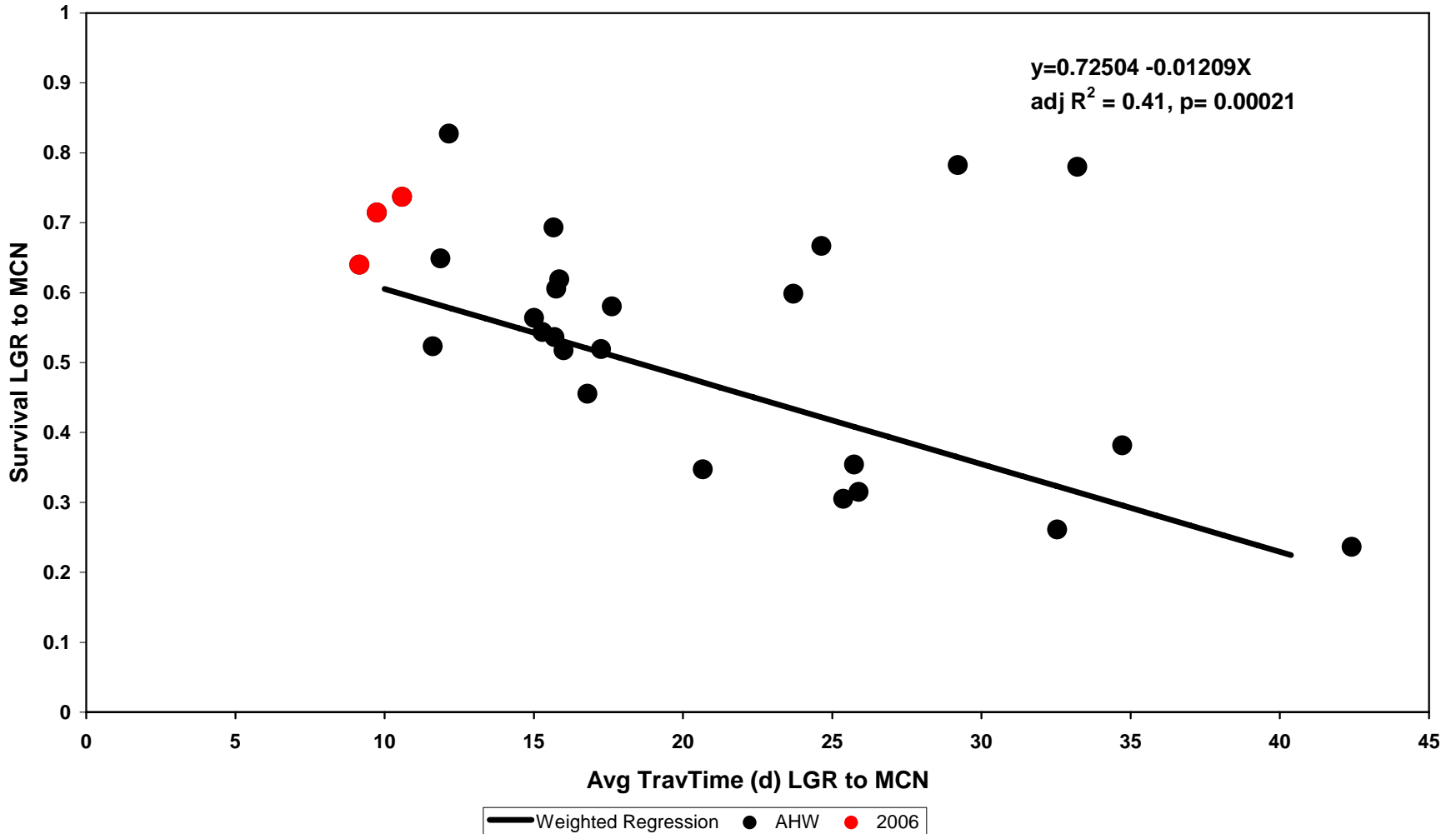
# Survival versus WTT



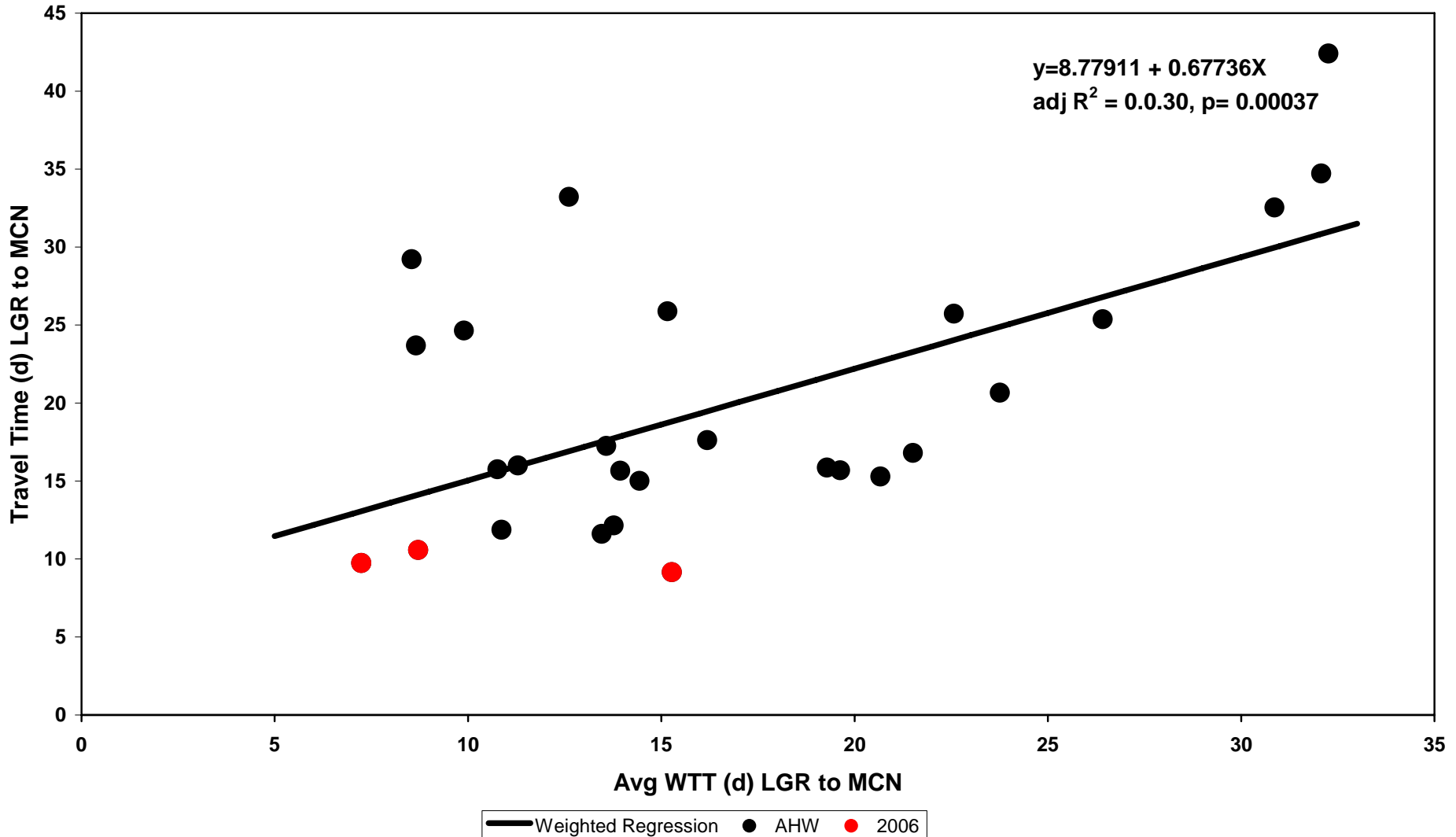
# Survival versus Avg Temp C



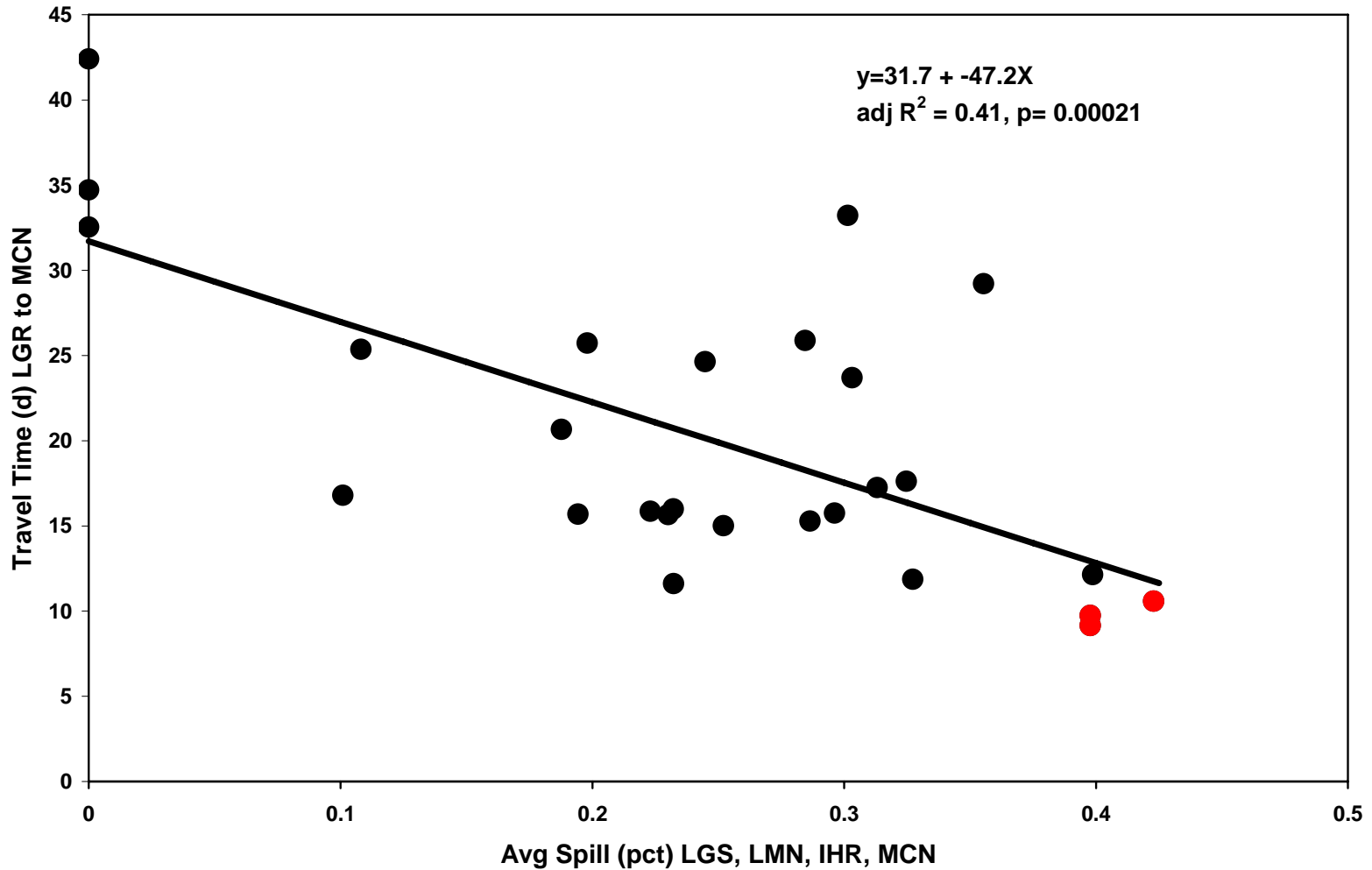
# Survival versus Travel Time



# Travel Time versus WTT



# Travel Time versus spill



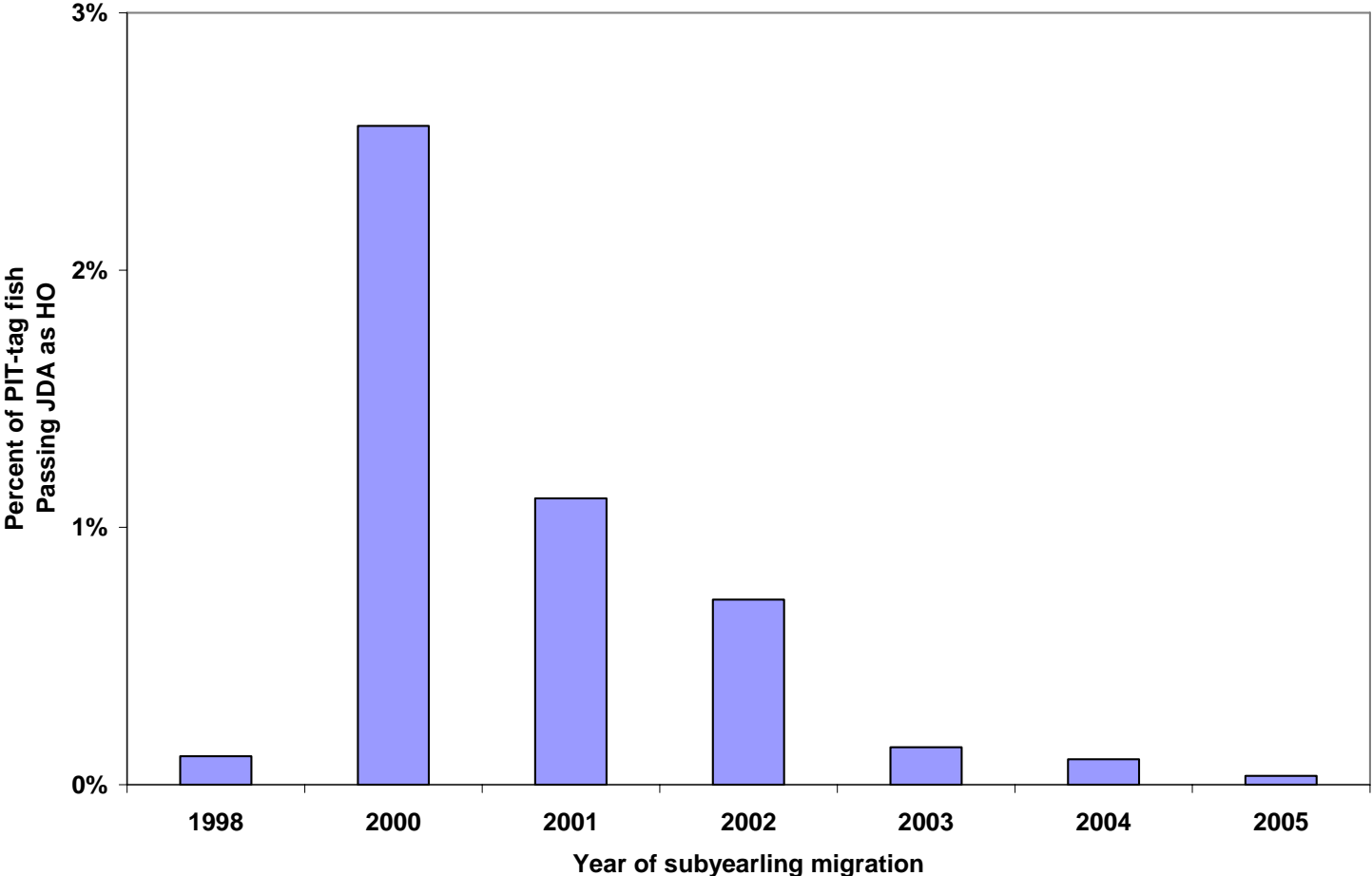
— Weighted Regression ● AHW ● 2006

# Is CJS appropriate for estimating Subyearling Chinook survival?

- Two basic model assumptions are violated when holdover fish are modeled with subyearlings
  - Equal probability of detection
  - And equal survival for group
- FPC analysis addresses these potential sources of bias by limiting scope of analysis
  - Survival groups represent active migrants since they are detected at LGR and...
  - Limit time period of estimation to minimize holdover proportions in group (last date at LGR 7/15)
  - Remove small proportion of holdover detections from detection history prior to estimating group survival



# Proportion of Holdover Fish in FPC survival Groups



# Conclusions

- Survival in 2006 was relatively high based on comparison with other recent years
- Survival and travel time showed significant relationship to all environmental parameters
- We identified production/wild group of tags as most appropriate for multiyear analysis
- CJS is appropriate model given the limited affect of holdover fish on the survival estimates used in this analysis