Survival and Travel Time of Migrating Salmonid Smolts in the Snake and Lower Columbia Rivers

Update with Preliminary 2012 Data

Anadromous Fish Evaluation Program
Annual Review
November 28, 2012

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- Summary of migration conditions, juvenile travel time, and juvenile survival through the hydropower system

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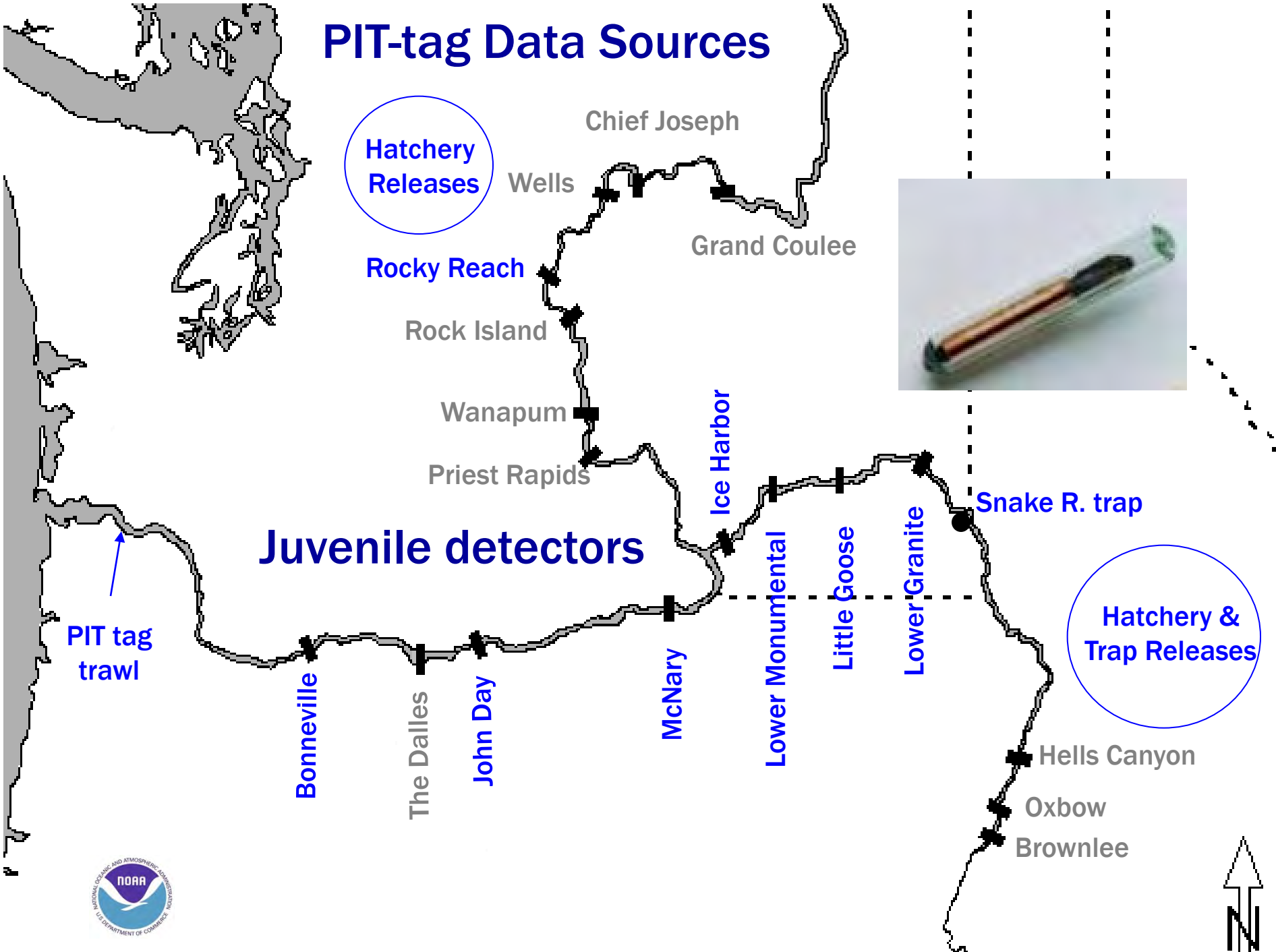
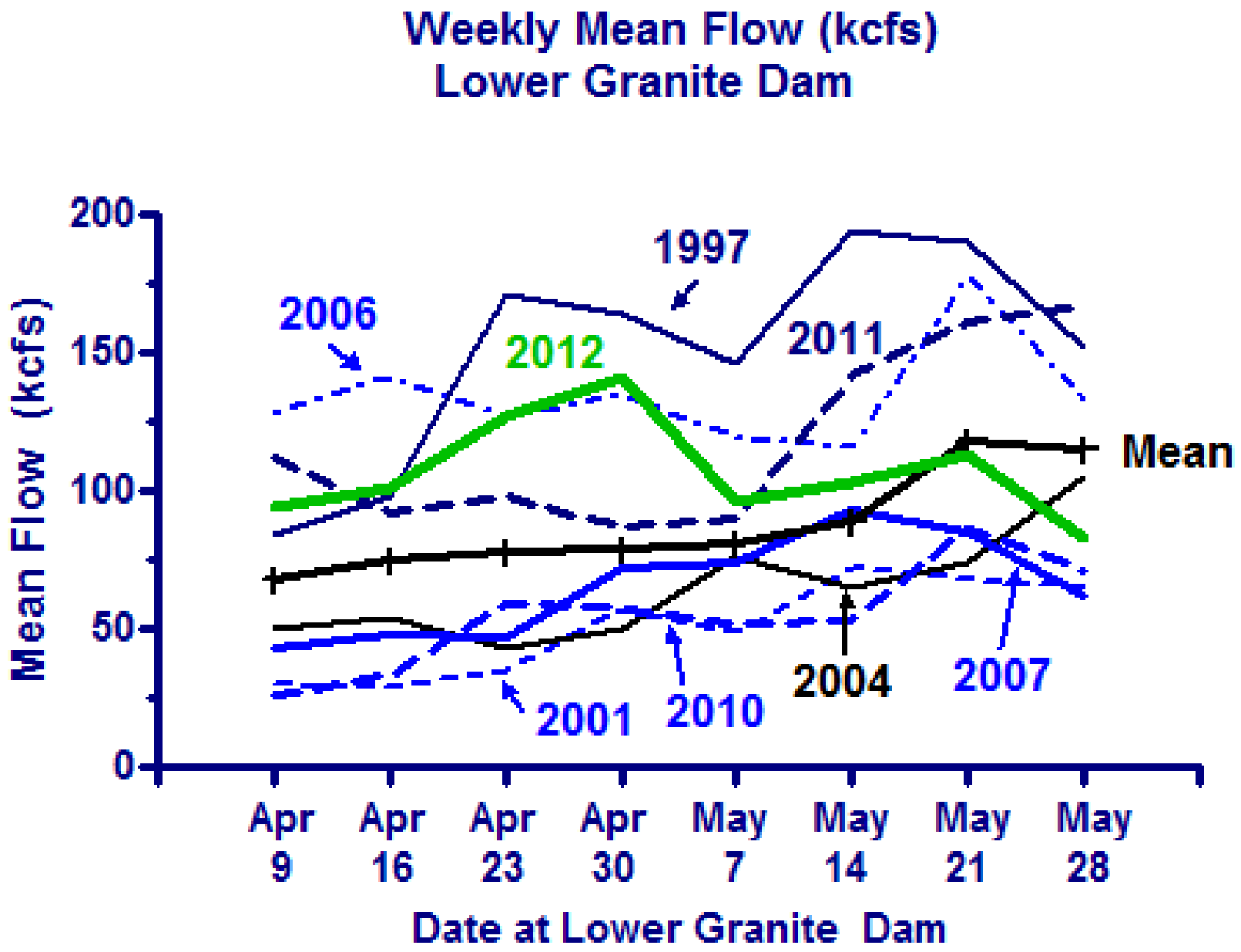
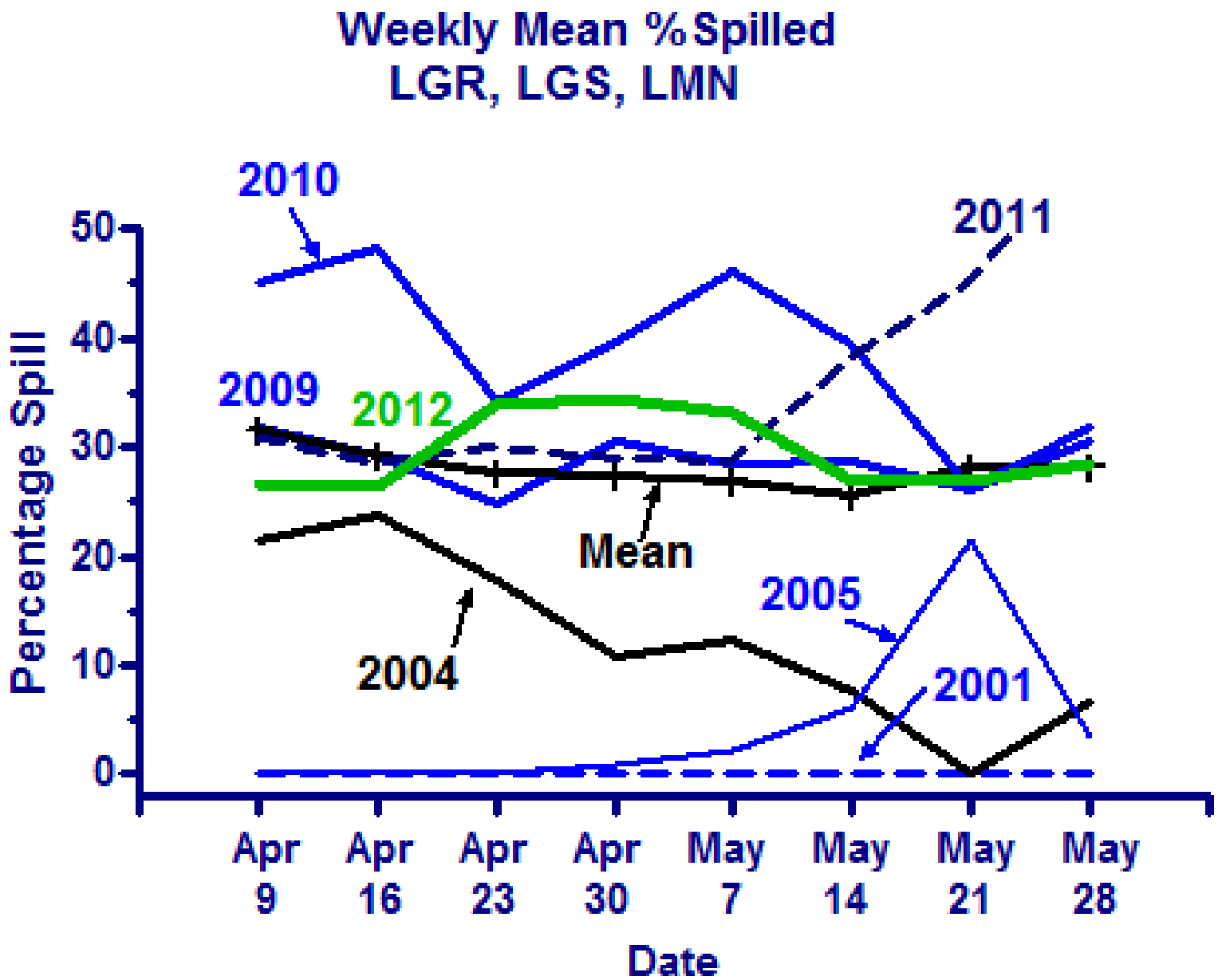
- Only those fish left to migrate in-river
- Only juvenile data, not survival to adult

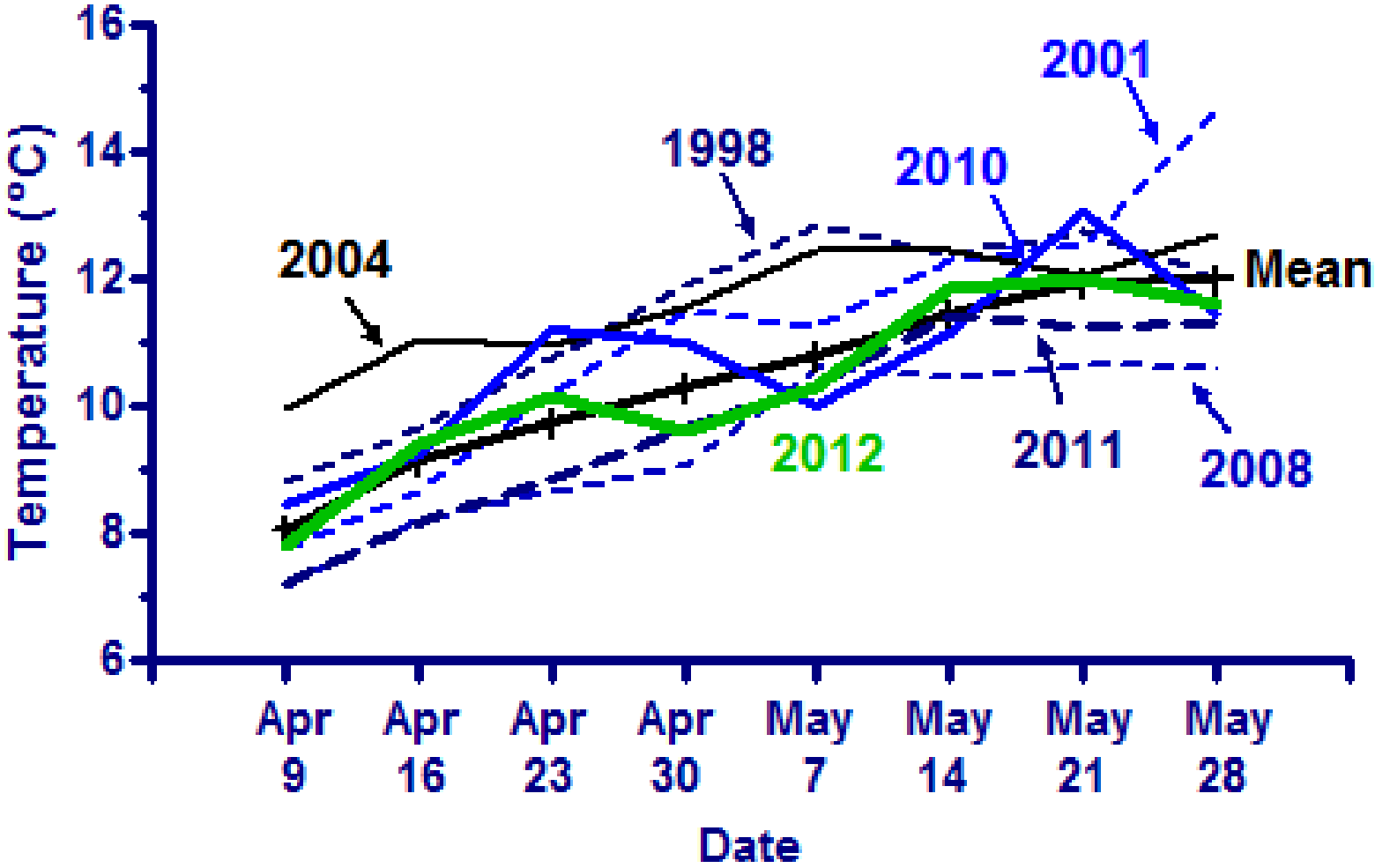
PIT-tag Data Sources



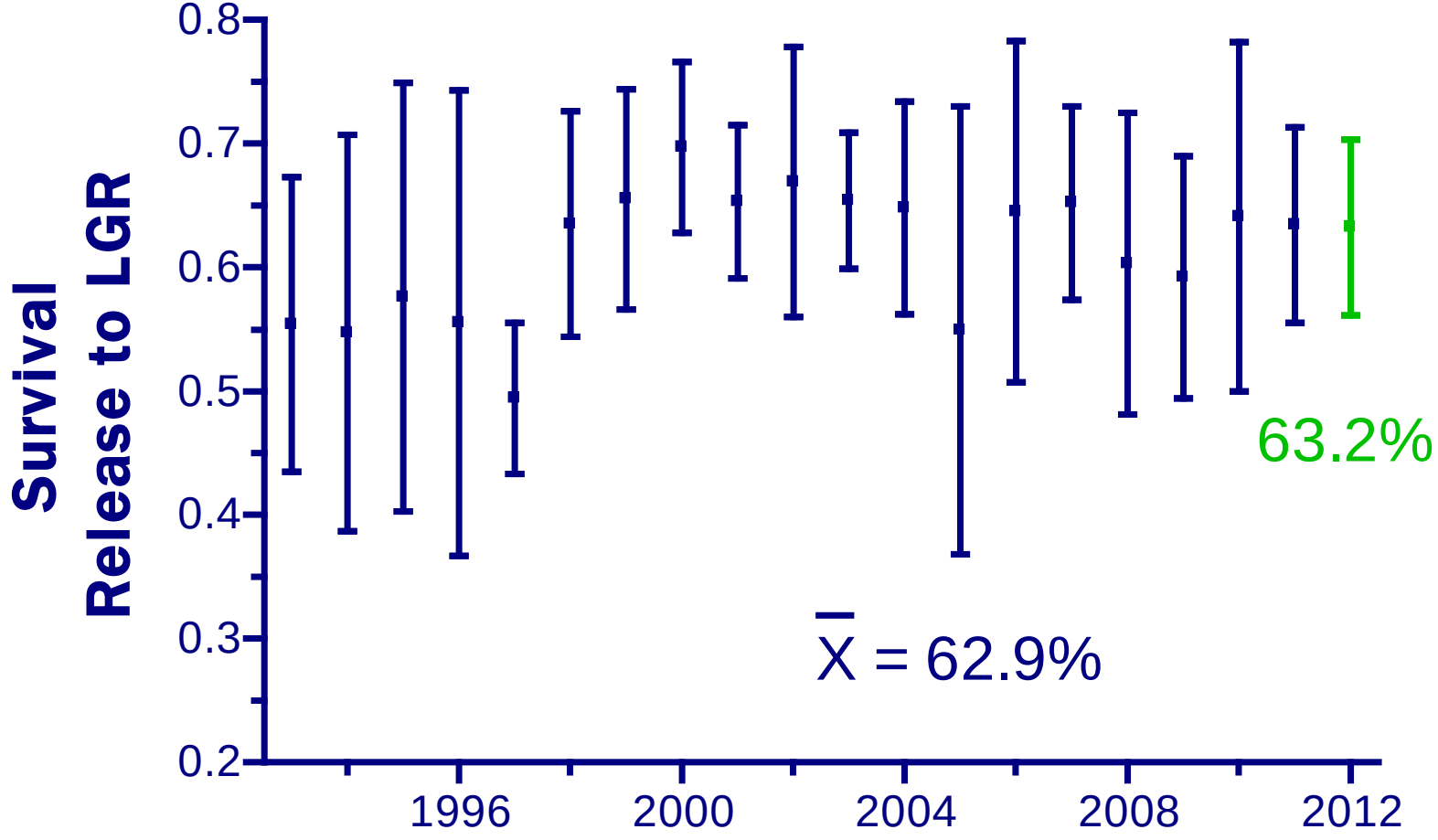

Weekly Mean Flow (kcfs)
Lower Granite Dam
Mean Flow (kcfs)
200
150
100
50
0
1997
2006
2012
2011
Mean
2004
2007
2001
2010
Apr 9
Apr 16
Apr 23
Apr 30
May 7
May 14
May 21
May 28
Date at Lower Granite Dam


Weekly Mean %Spilled
LGR, LGS, LMN
2010
2011
2009
2012
Mean
2005
2004
2001
Percentage Spill
50
40
30
20
10
0
Apr 9
Apr 16
Apr 23
Apr 30
May 7
May 14
May 21
May 28
Date

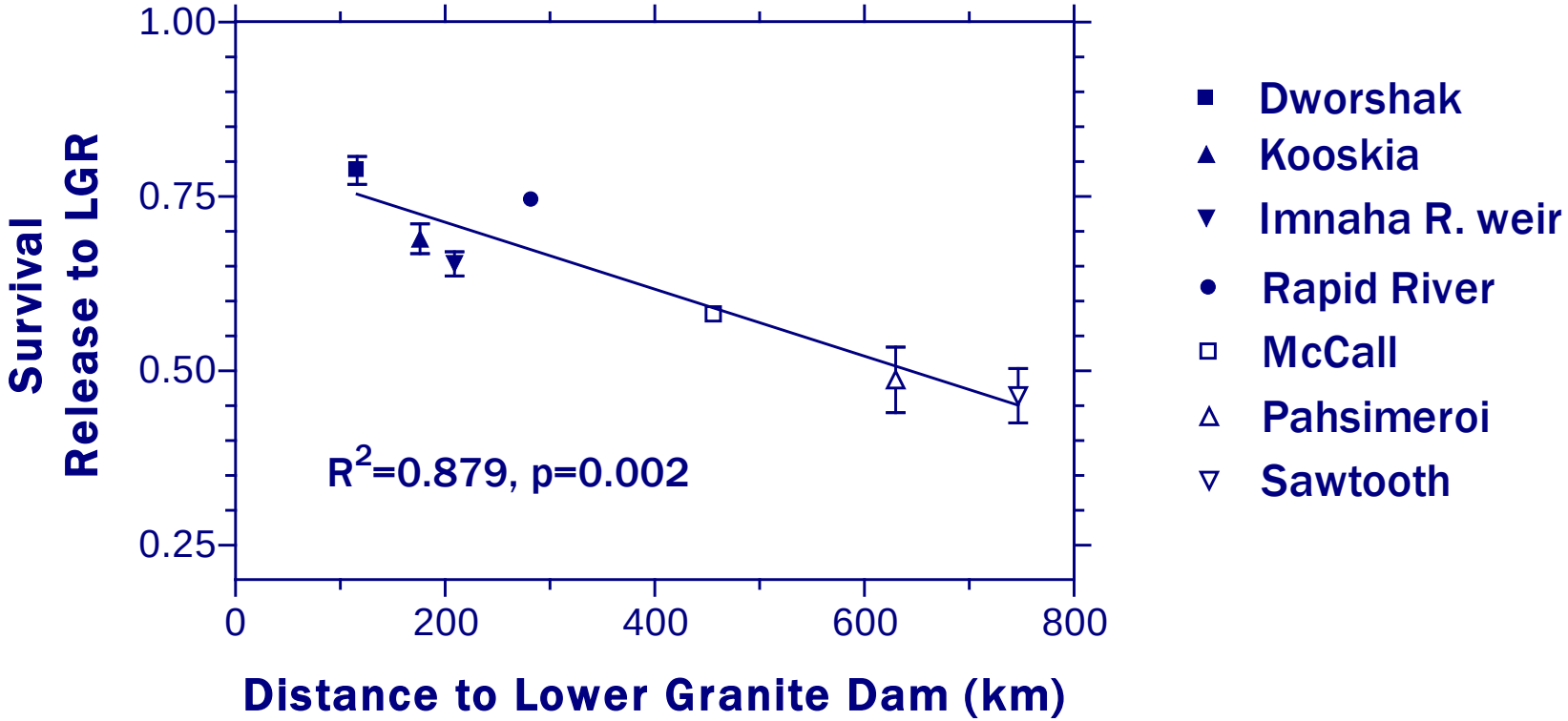
Weekly Mean Temperature
Little Goose Dam



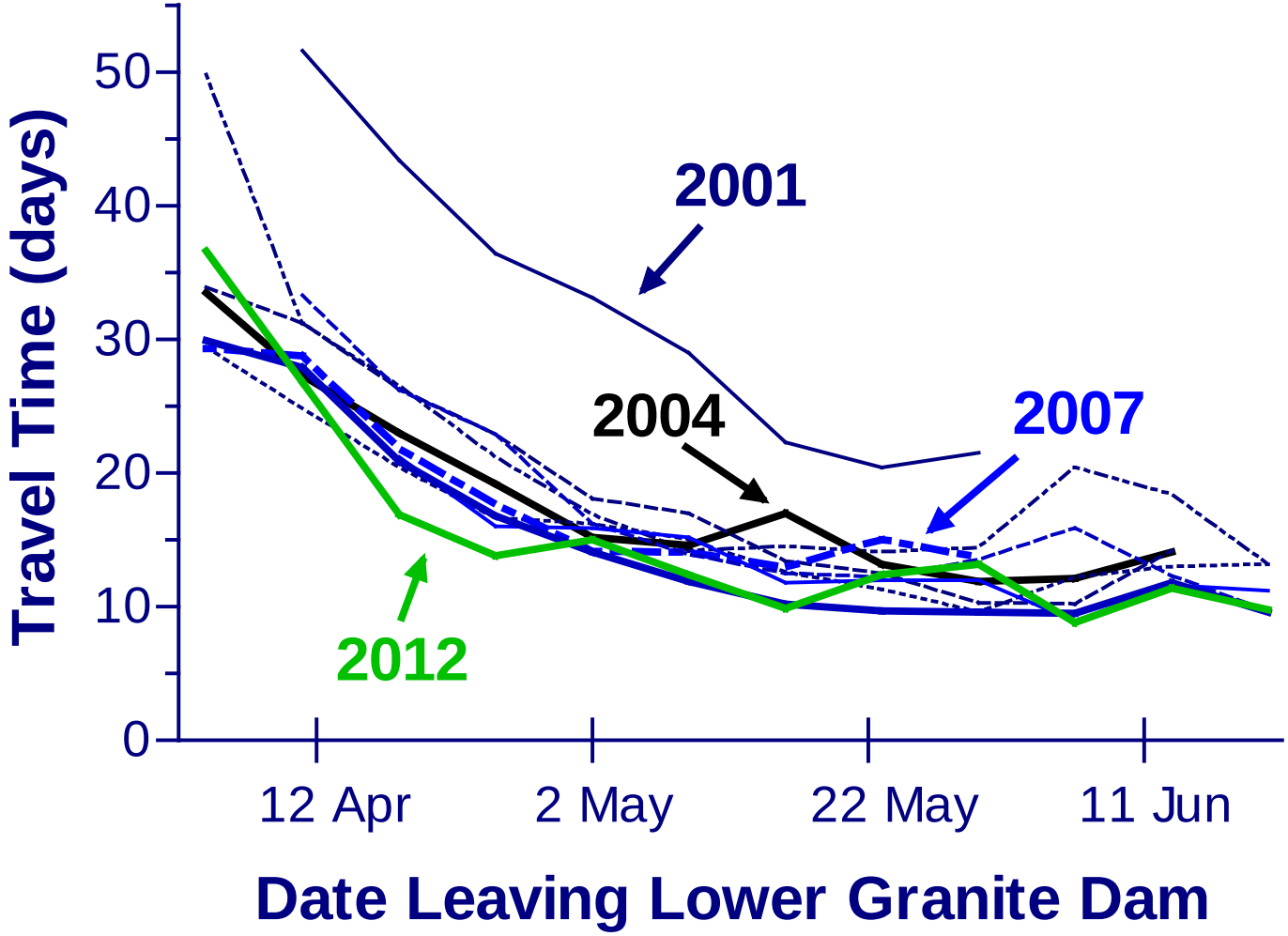
Yearling Chinook
Snake River Basin Hatcheries
Mean of Index Groups



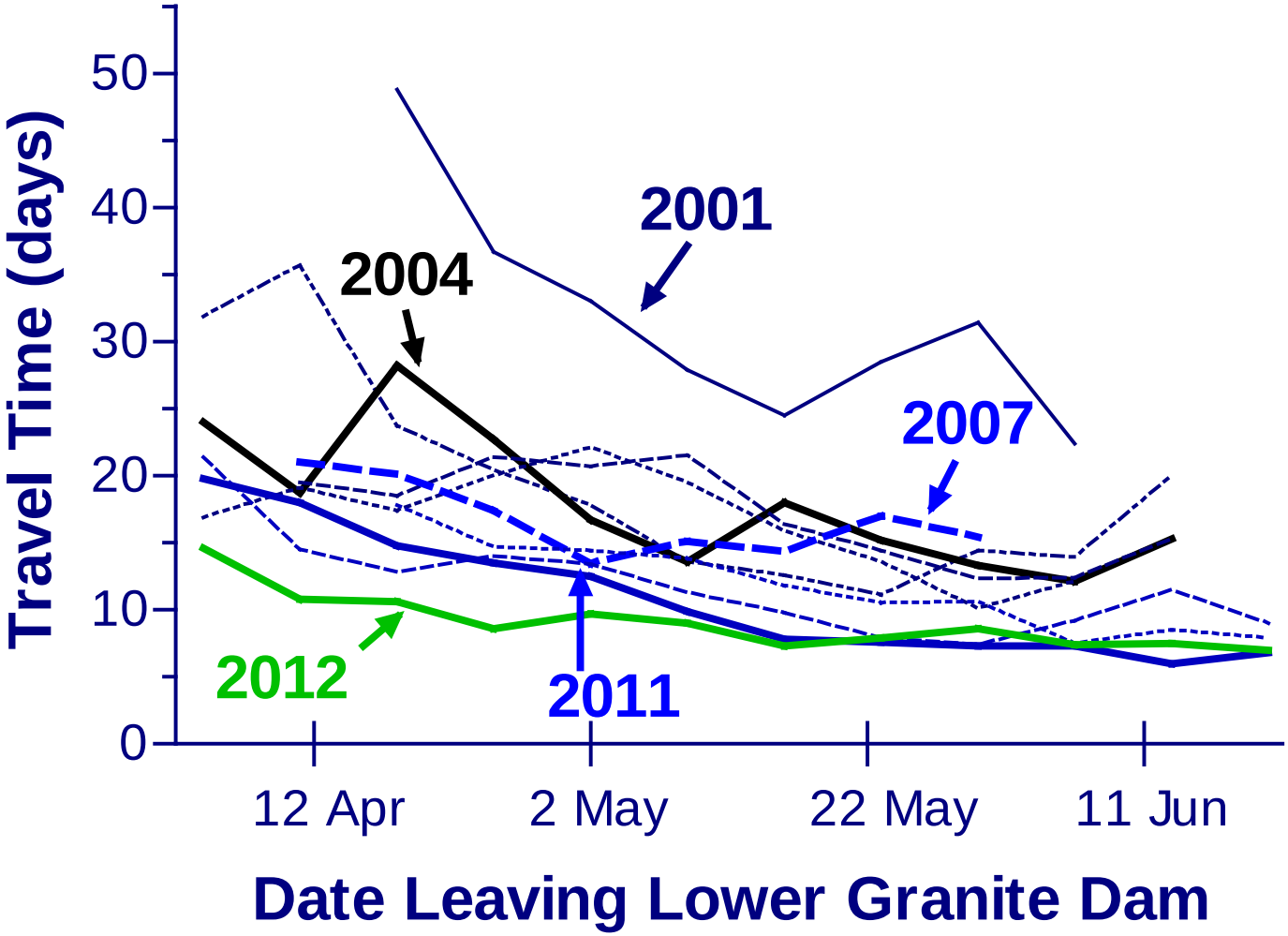
Hatchery yearling Chinook (2002-2012)



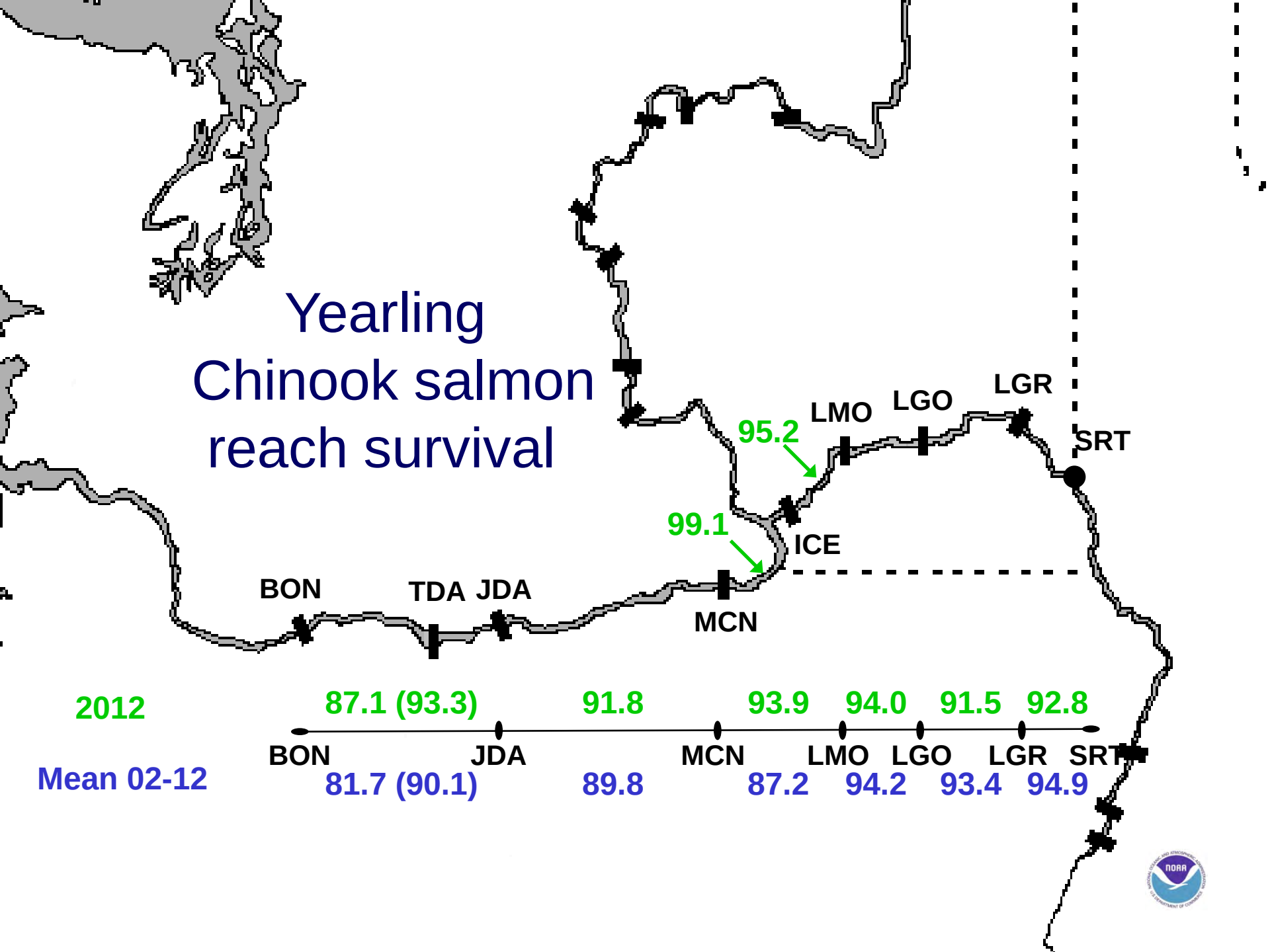
Yearling Chinook Median Travel Time Lower Granite to Bonneville (461 km)

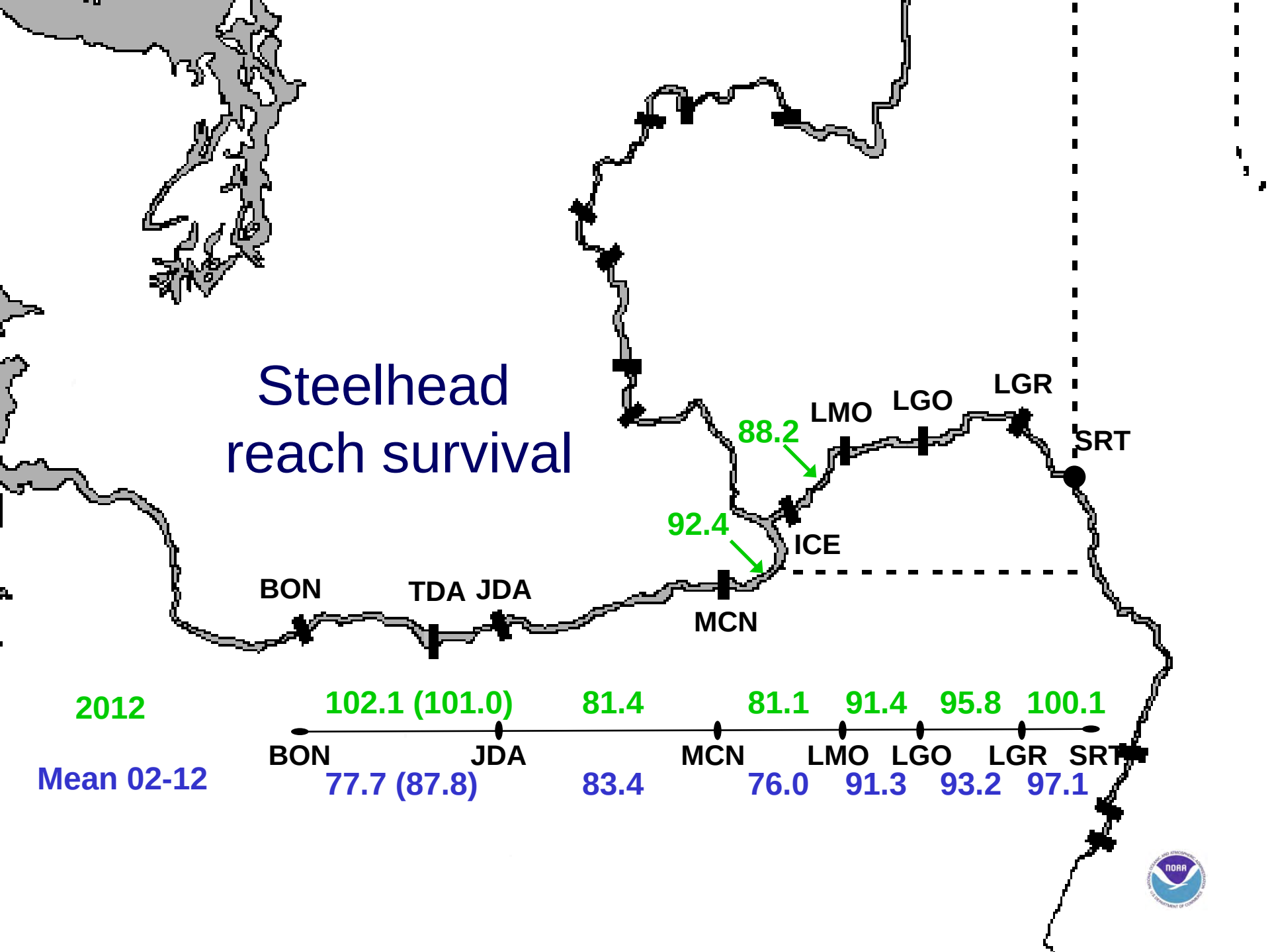


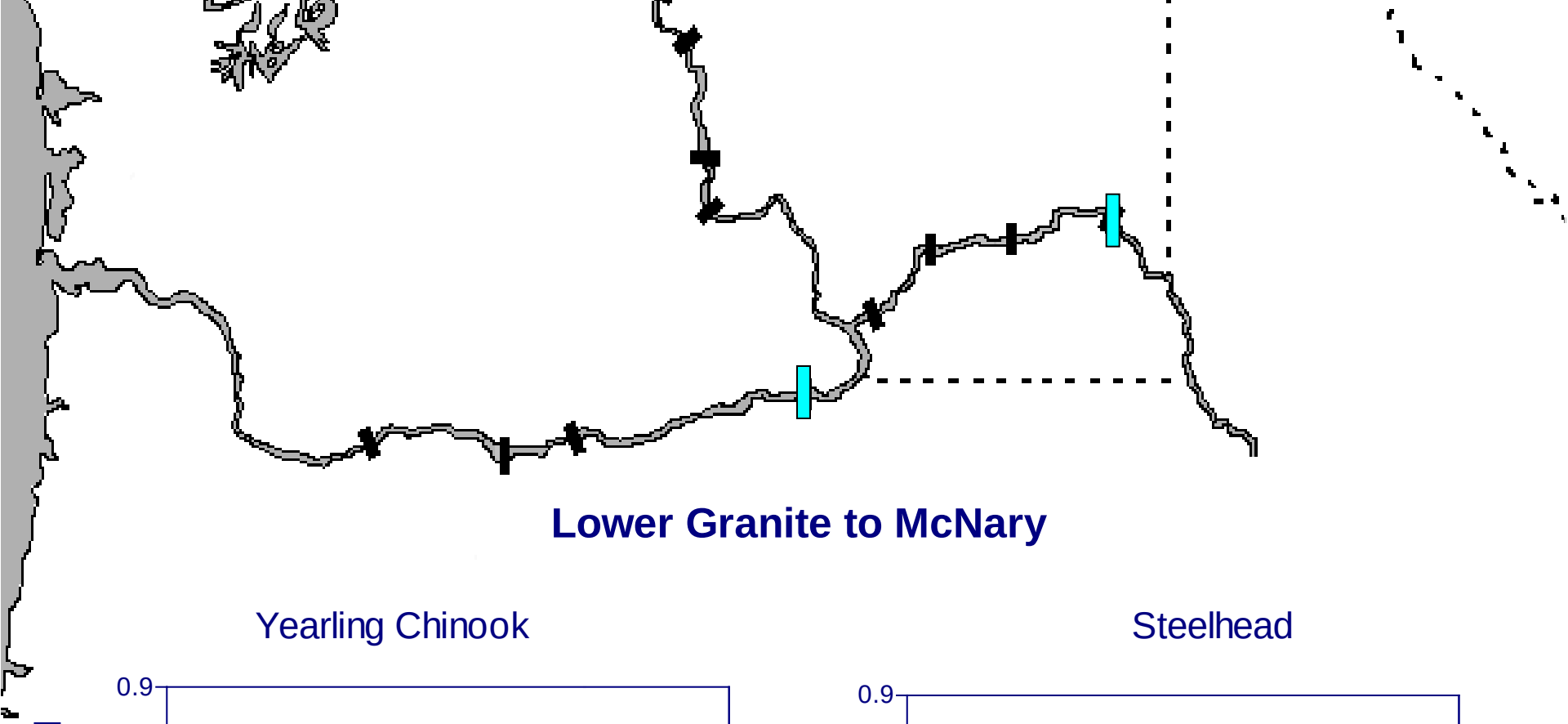
Steelhead Median Travel Time
Lower Granite to Bonneville (461 km)



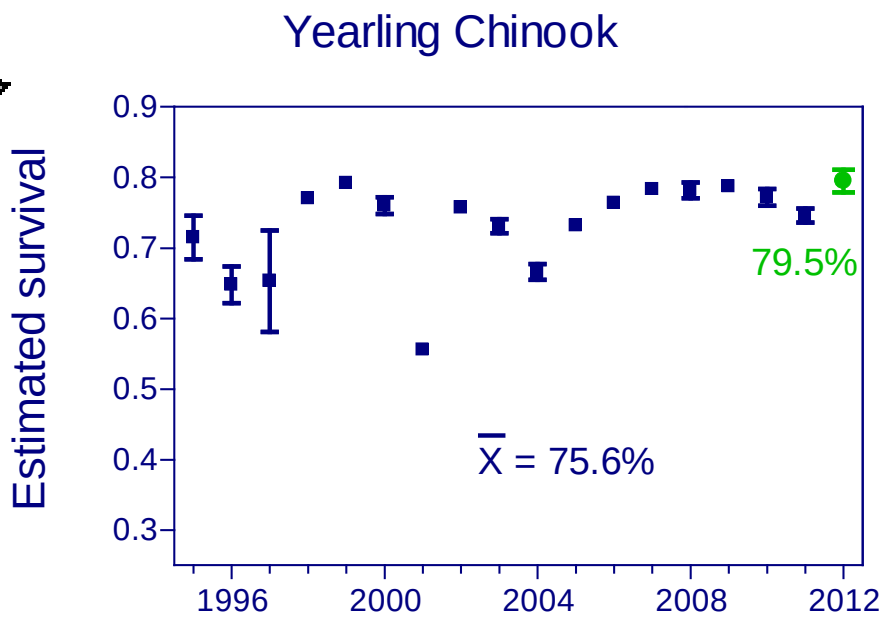
Yearling Chinook salmon reach survival

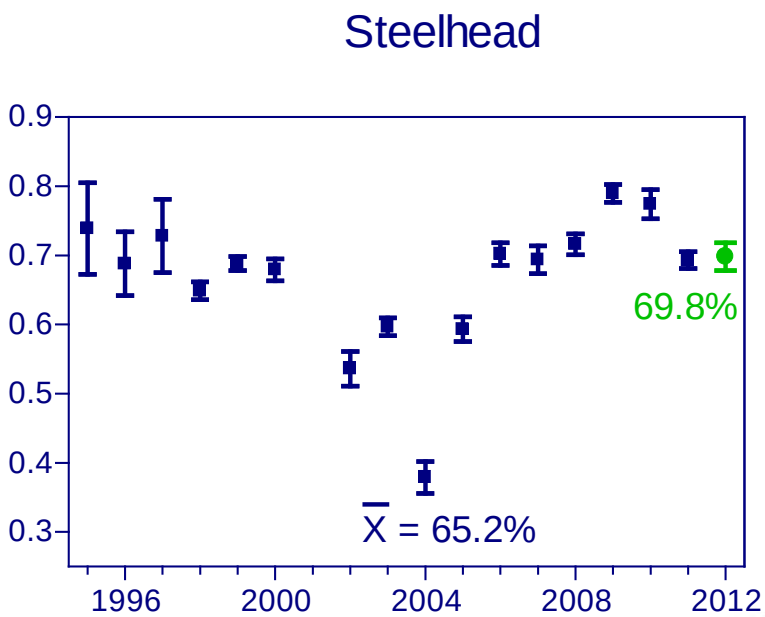


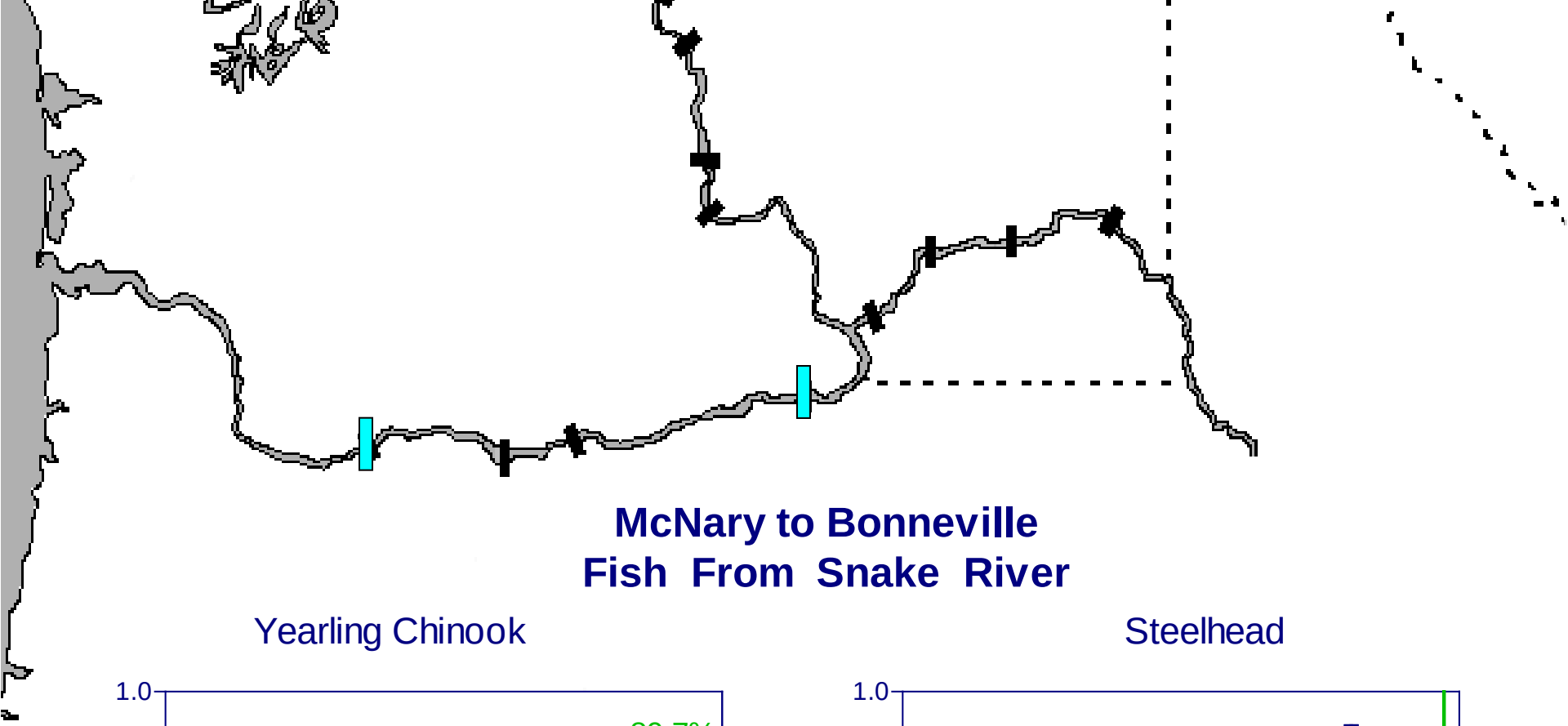

Steelhead
reach survival
88.2
92.4
LGR
LGO
LMO
SRT
ICE
MCN
BON
TDA
JDA
2012
102.1 (101.0)
81.4
81.1
91.4
95.8
100.1
BON
JDA
MCN
LMO
LGO
LGR
SRT
Mean 02-12
77.7 (87.8)
83.4
76.0
91.3
93.2
97.1



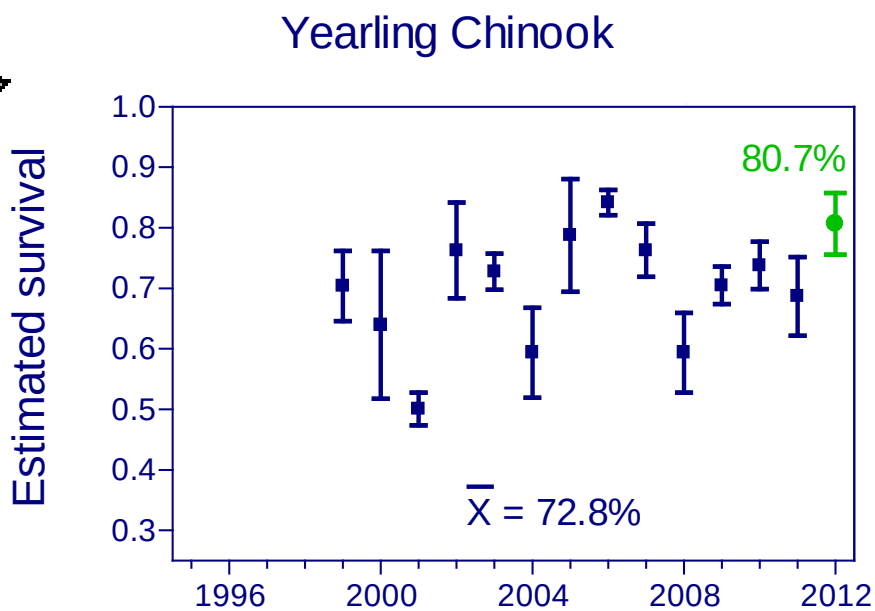
Lower Granite to McNary

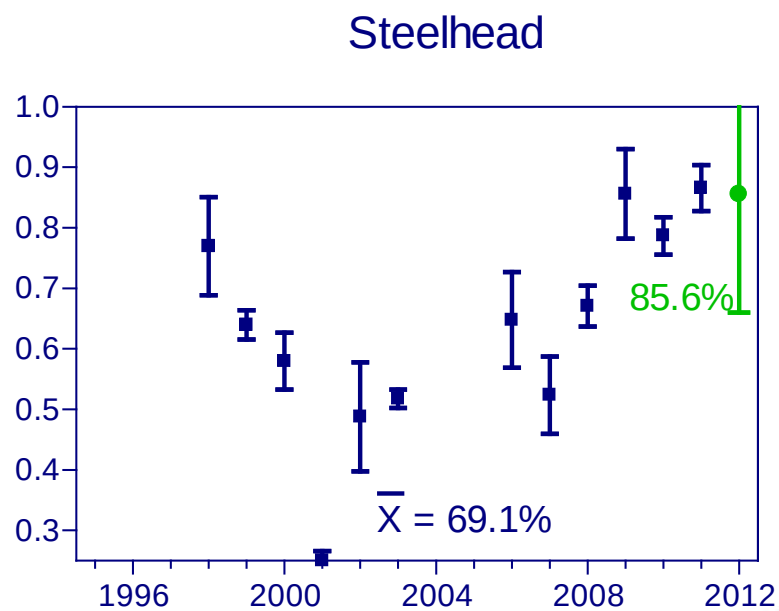


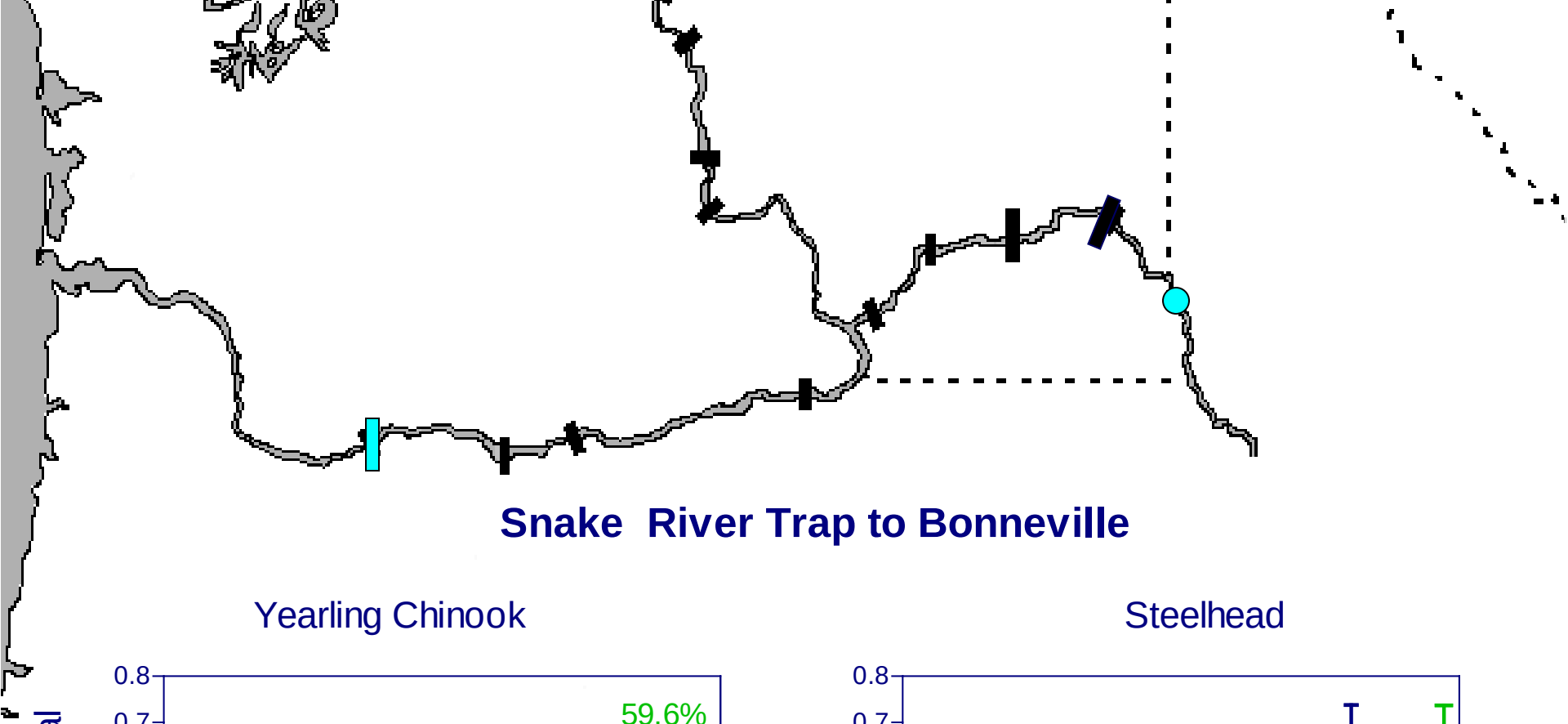




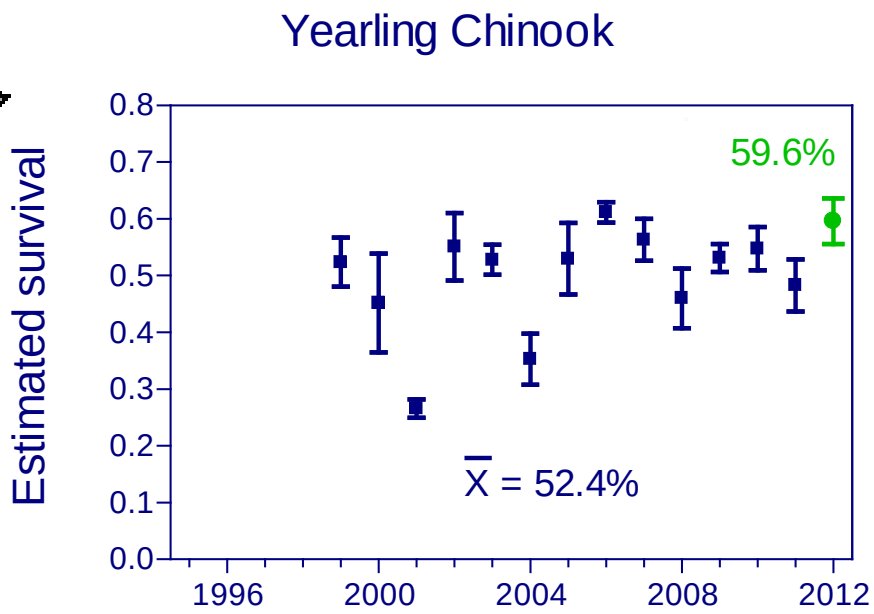
McNary to Bonneville
Fish From Snake River

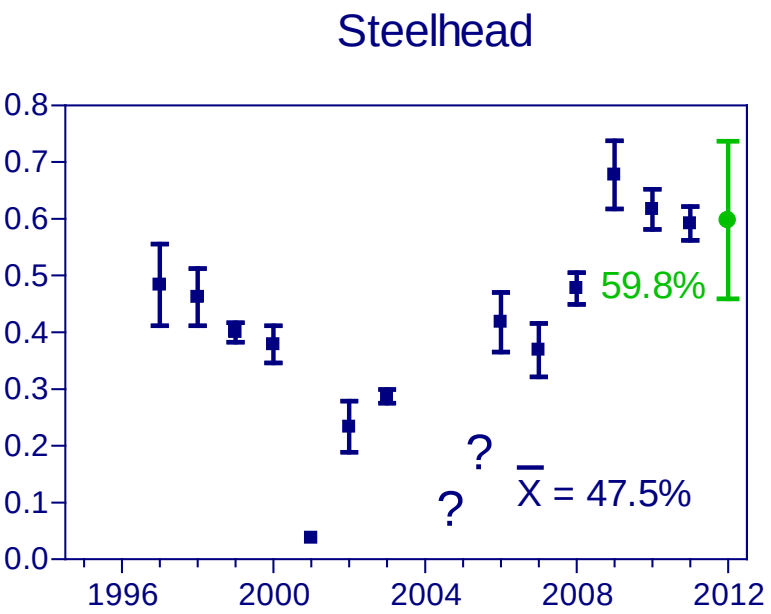






Snake River Trap to Bonneville





Detection in Lower River

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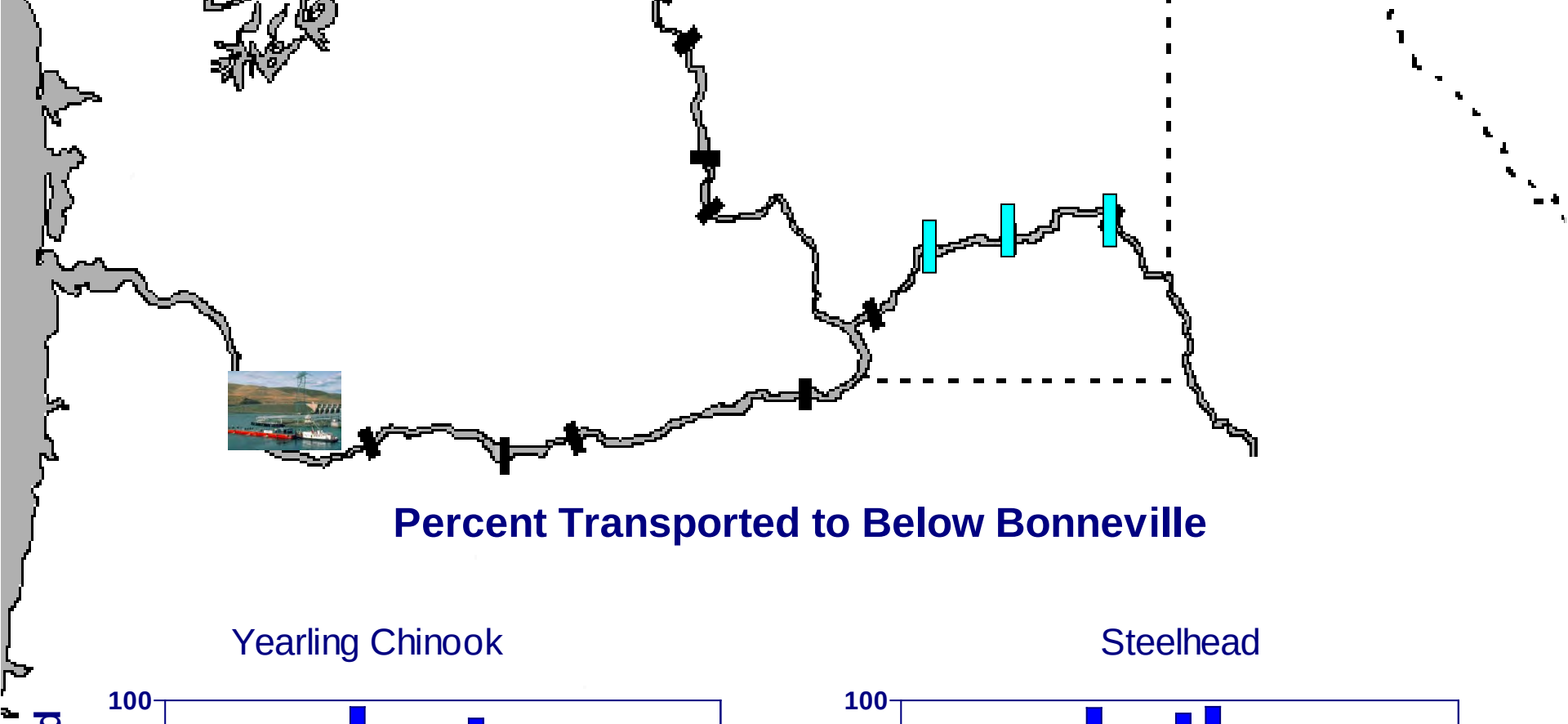
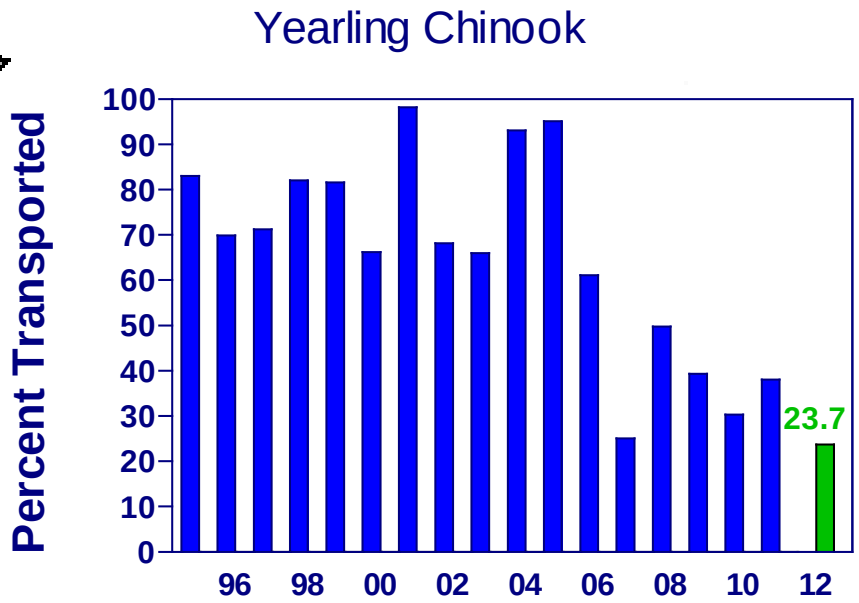
  - Detection in PIT trawl is low relative to bypass systems
  - Bird-island recoveries appear to be biased “sample”
  - Adult detections possibly useable, but it takes several years!
  - PIT trawl remains essential to estimate to Bonneville

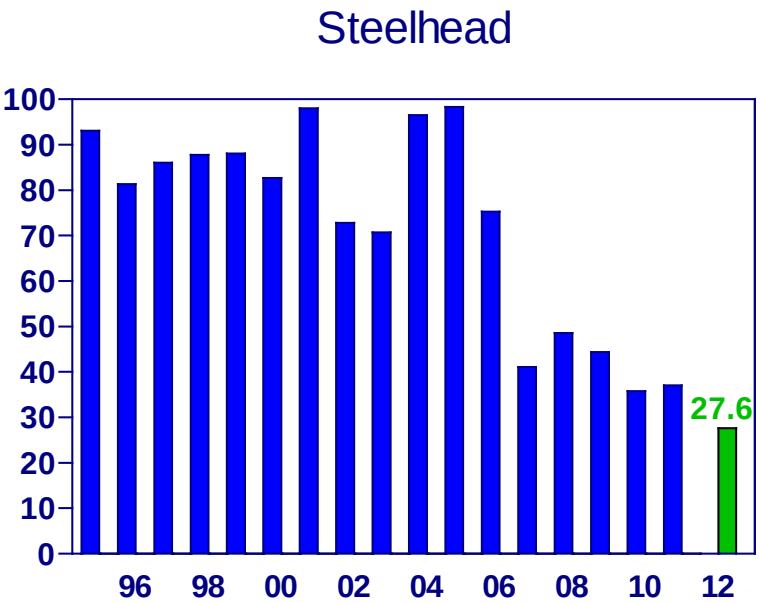
Preliminary estimates of transport % for 2012 based on PIT-tag data

- **23% wild Chinook**
- **25% hatchery Chinook**
- **28% wild steelhead**
- **27% hatchery steelhead**



Percent Transported to Below Bonneville





Preliminary estimates of transport %

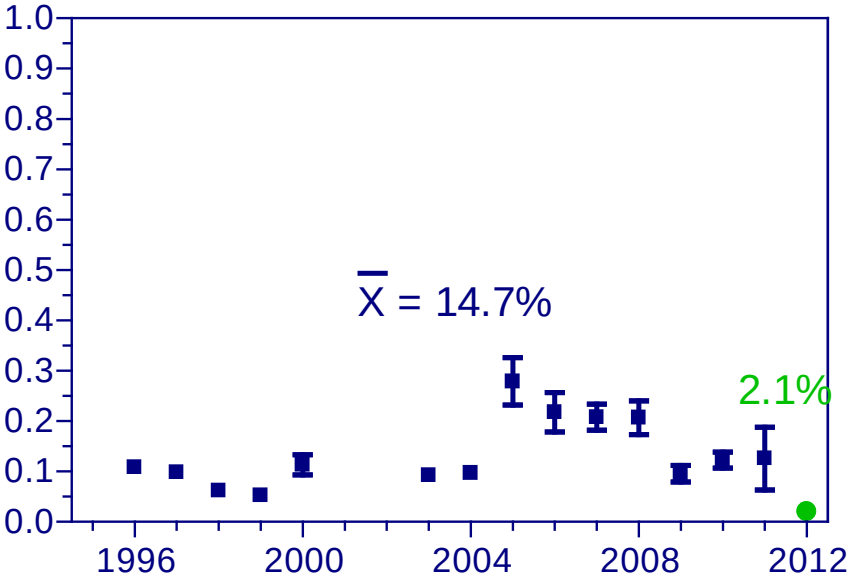
- 67% of Chinook and 59% of steelhead passed LGR before transportation began on May 2

- After transportation started: about 58% of smolts that arrived at LGR were transported

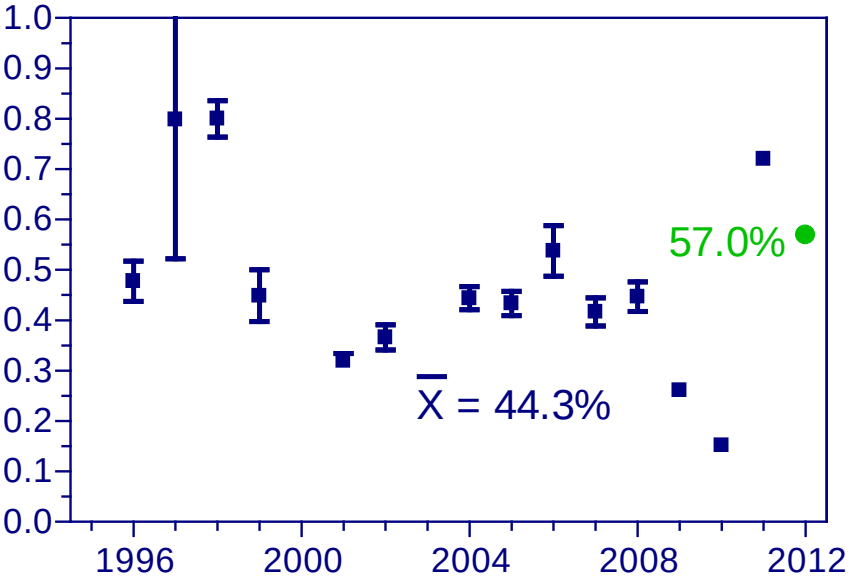
Sockeye Survival

Snake River Sockeye
Redfish Lake to Lower Granite

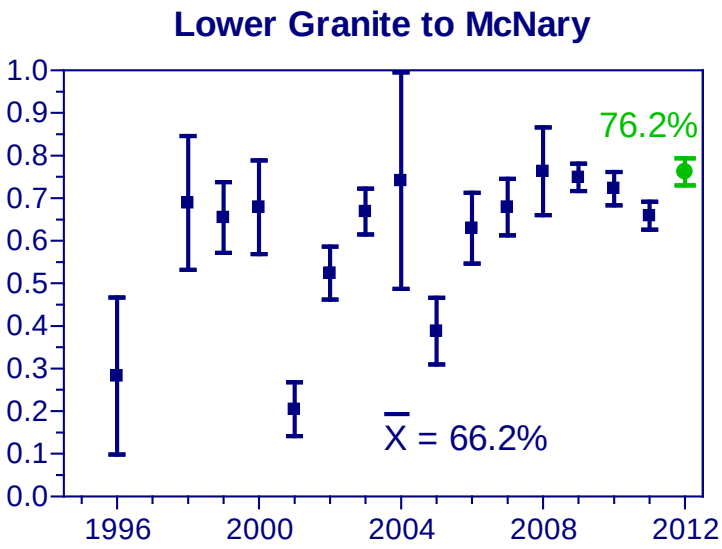
Released as parr in fall

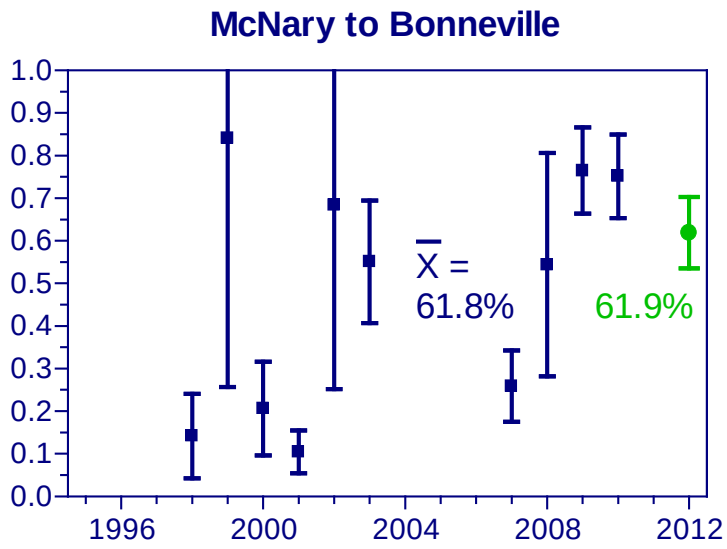


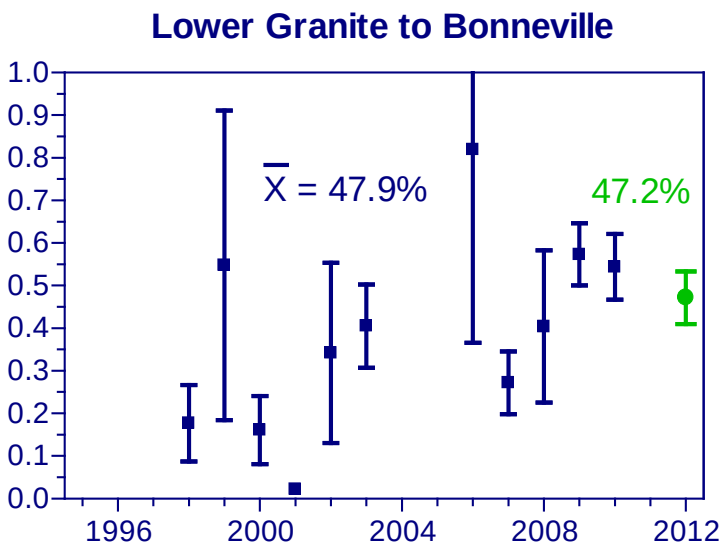
Released as smolts in spring



Snake River Sockeye
Smolts Migrating in Spring







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- Residualization is reduced when time in river is reduced

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  - increased number of in-river migrants
  - increased survival of those remaining in-river
  - not necessarily increased smolt-to-adult survival for the population
  - to improve survival to adult for population, in-river increases have to exceed benefit of transport (see you in an hour)

Questions