AFEP Review

Kintama Research

"Creating a Revolution in Marine Science"

THE 2008 POST STUDY: BIOLOGICAL RESULTS FOR SNAKE & YAKIMA R HATCHERY SPRING CHINOOK

David Welch[1], Erin Rechisky[2], Aswea Porter[1], & John McKern[3]

[1]Kintama Research, [2]UBC Fisheries Center, [3]Fish Passage Solutions

Outline of Talk

Kintama Research

Biological Results:

a) Tag Effects

b) POST tag vs NOAA PIT tag survival

c) Delayed [Latent] Mortality

d) Differential Survival Post-Transportation (Barging)

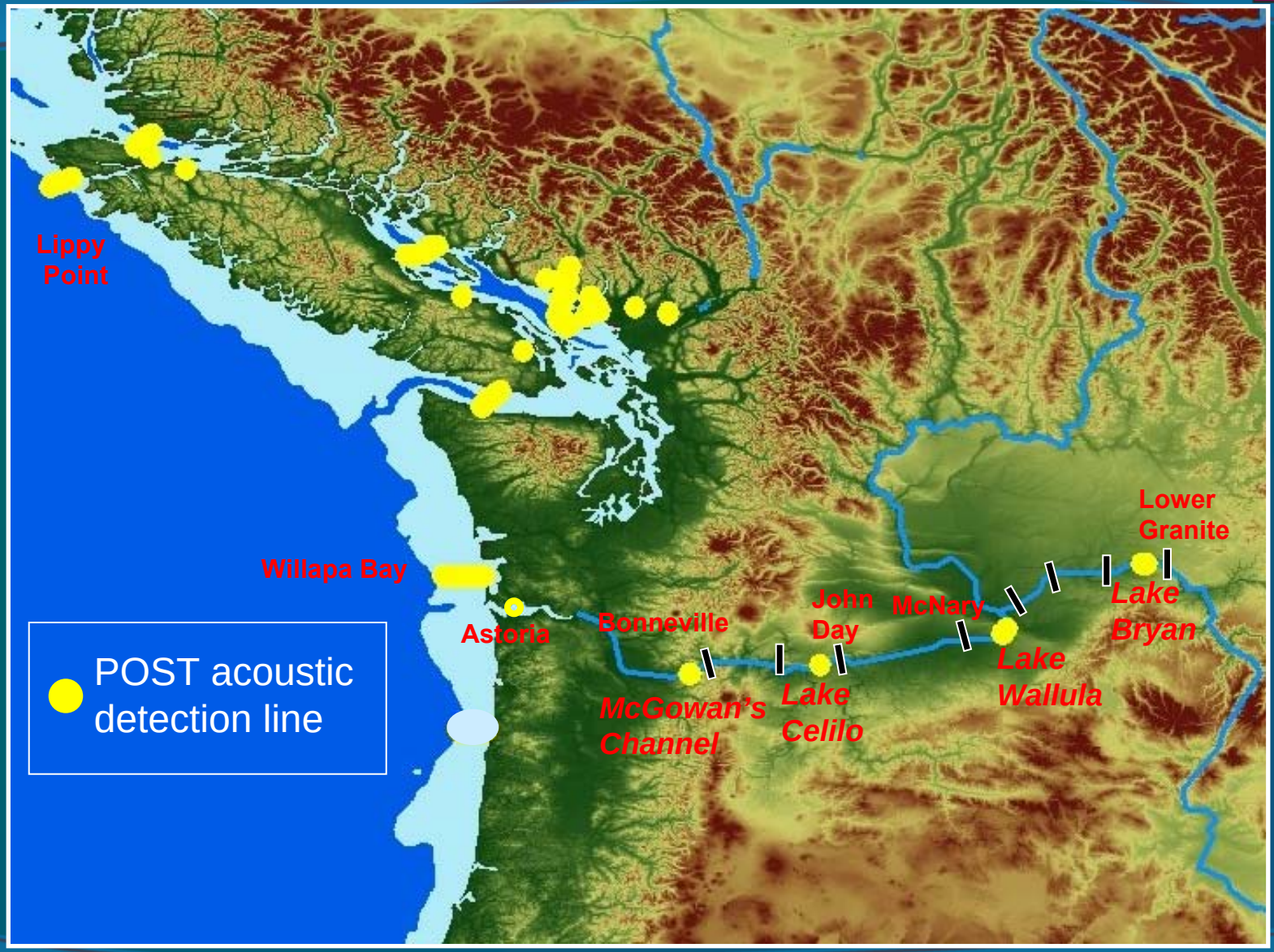
Goals

Kintama Research

1. Establish whether the POST technology will work for Columbia R salmon problems
   - Are the 7 mm & 9mm Vemco acoustic tags "*too big*"?
2. Test whether differential mortality of Snake R smolts is expressed below Bonneville Dam
3. Test whether transportation "helps or hinders"
   - Is survival of transported (barged) smolts reduced relative to ROR smolts?
4. Complete the "1st Generation" Pilot scale study. Establish a tool for addressing ocean issues for the Columbia

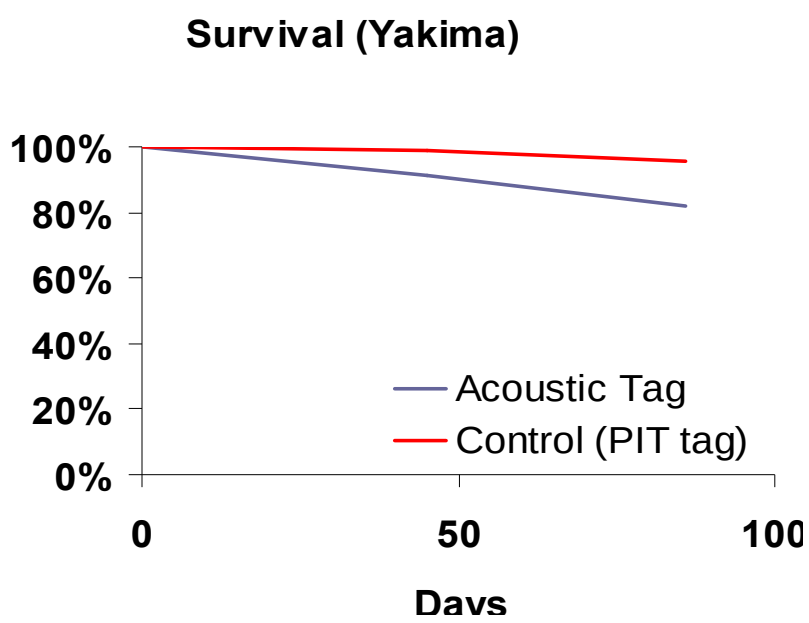
POST Arrays

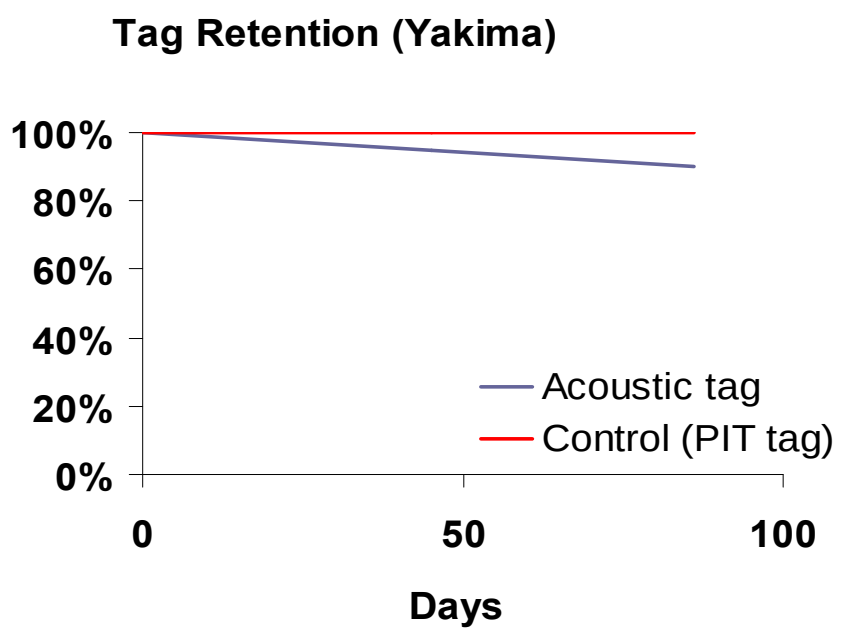
Kintama Research

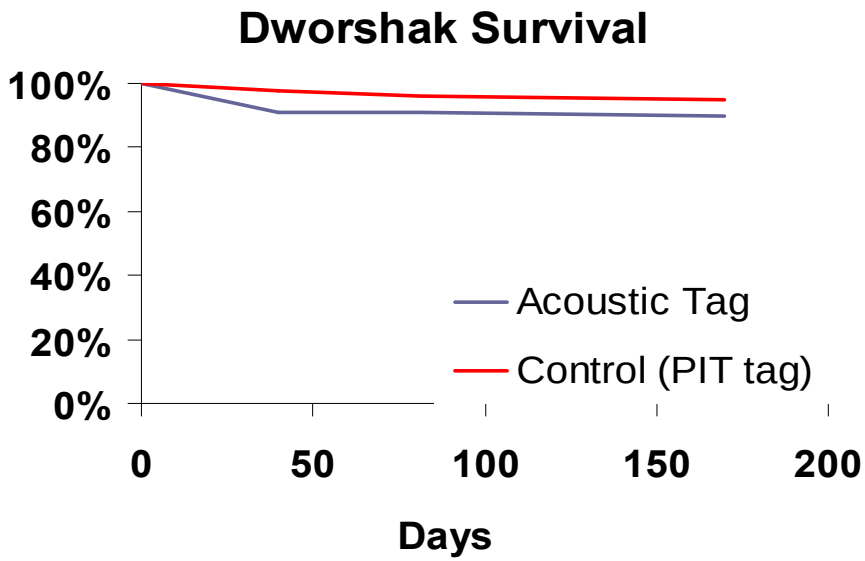


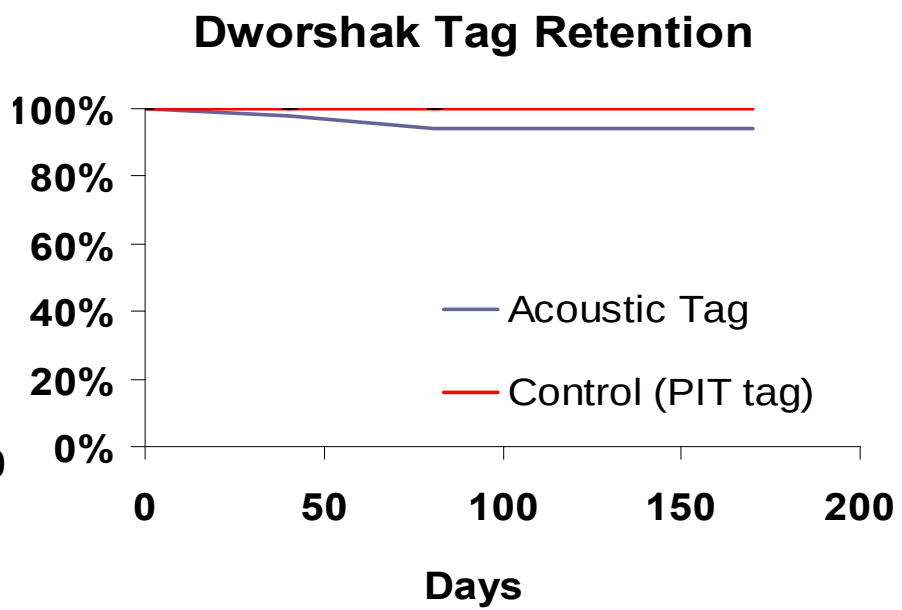
2006 Tag Effects: Survival & Retention

Kintama Research



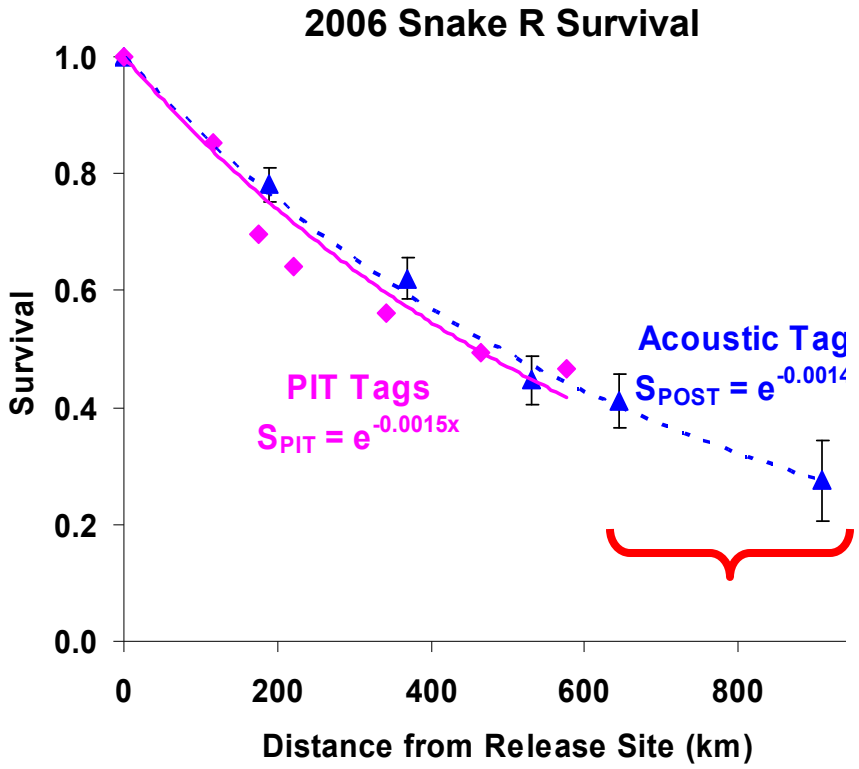


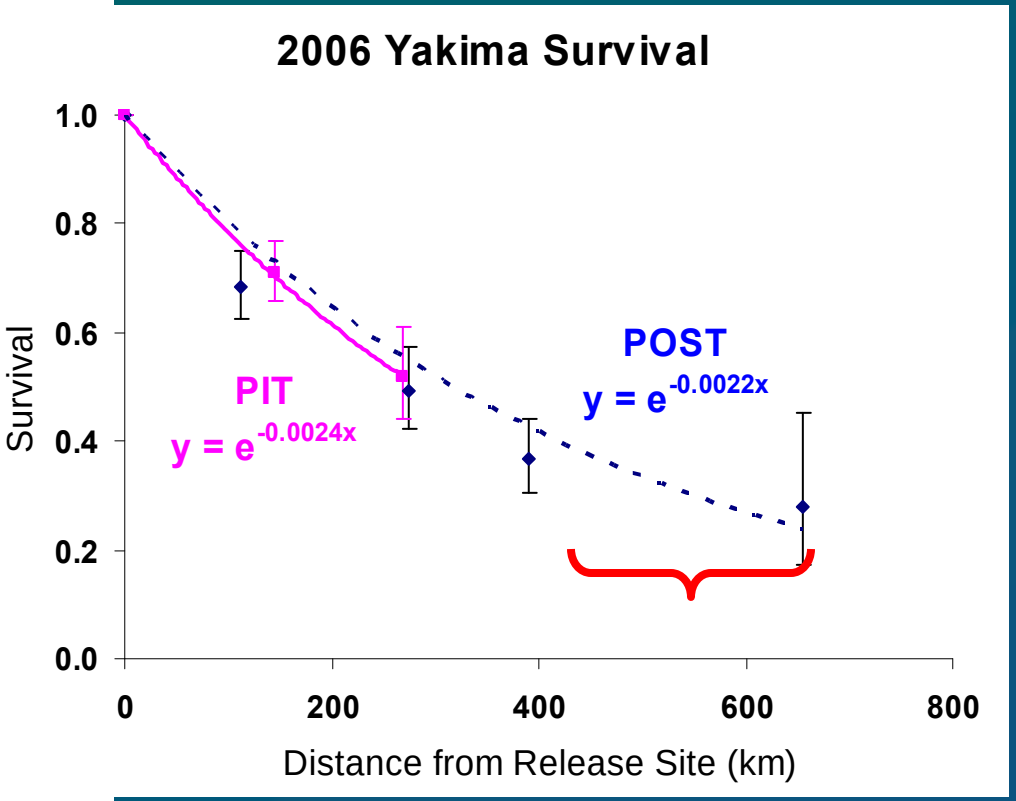




2006 Tag Effects: Relative In-river Survival of PIT & POST Tags

Kintama Research

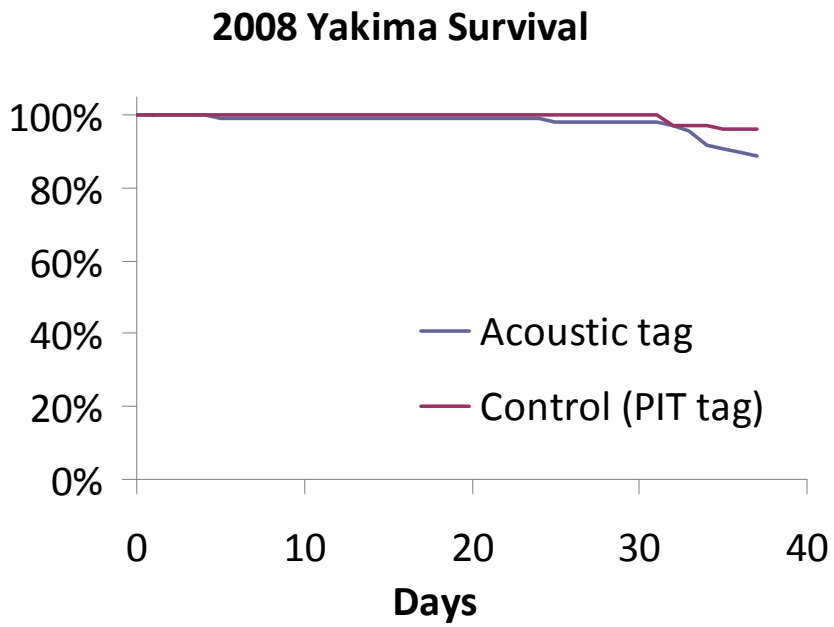


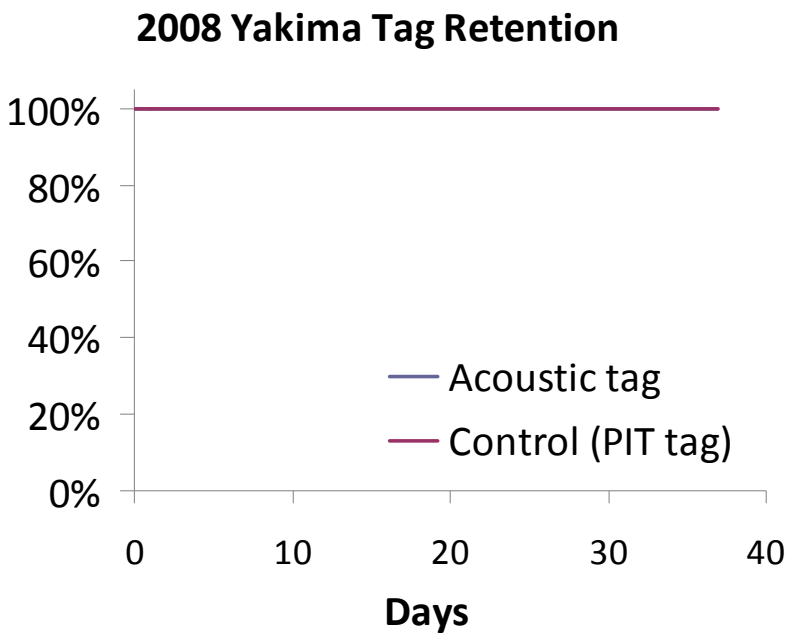


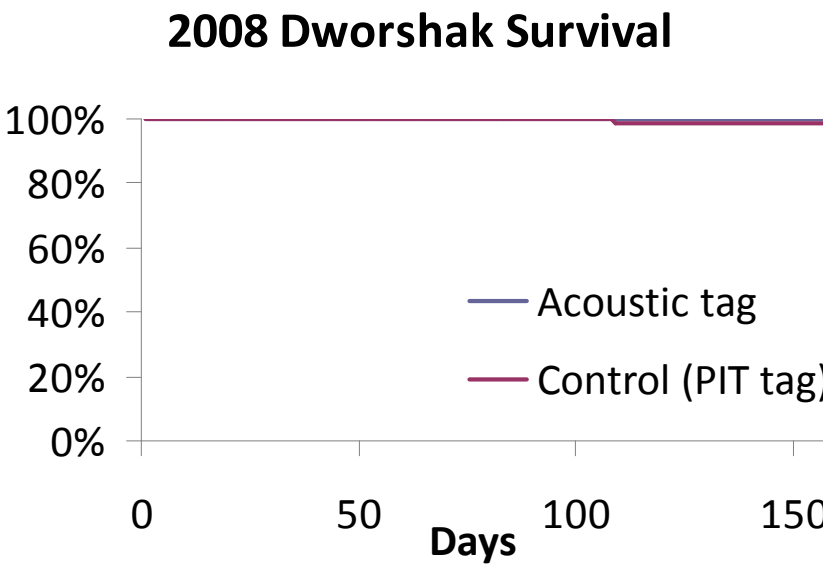
**** POST's acoustic tags yielded the same survival rates as PIT tags in 2006, for the size range of smolts studied.***

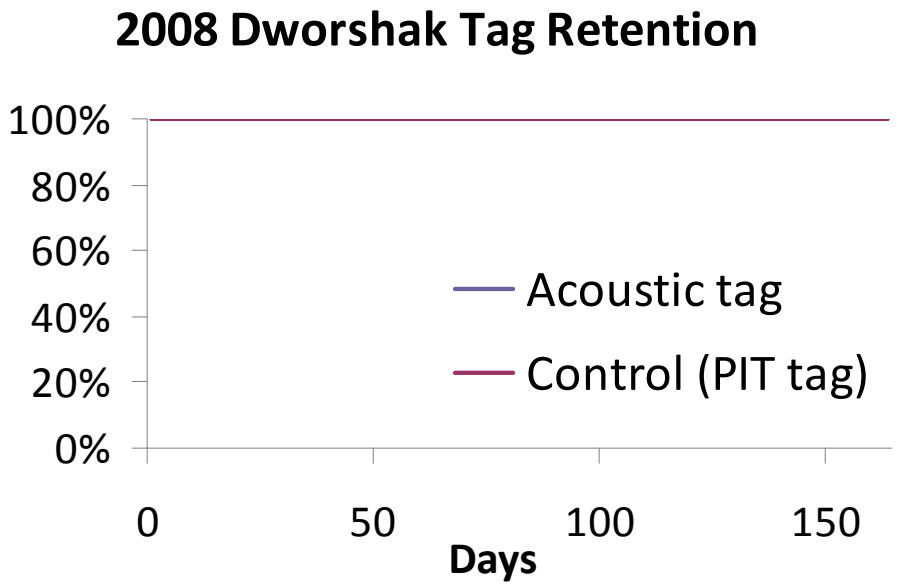
2008 Tag Effects: Survival & Retention

Kintama





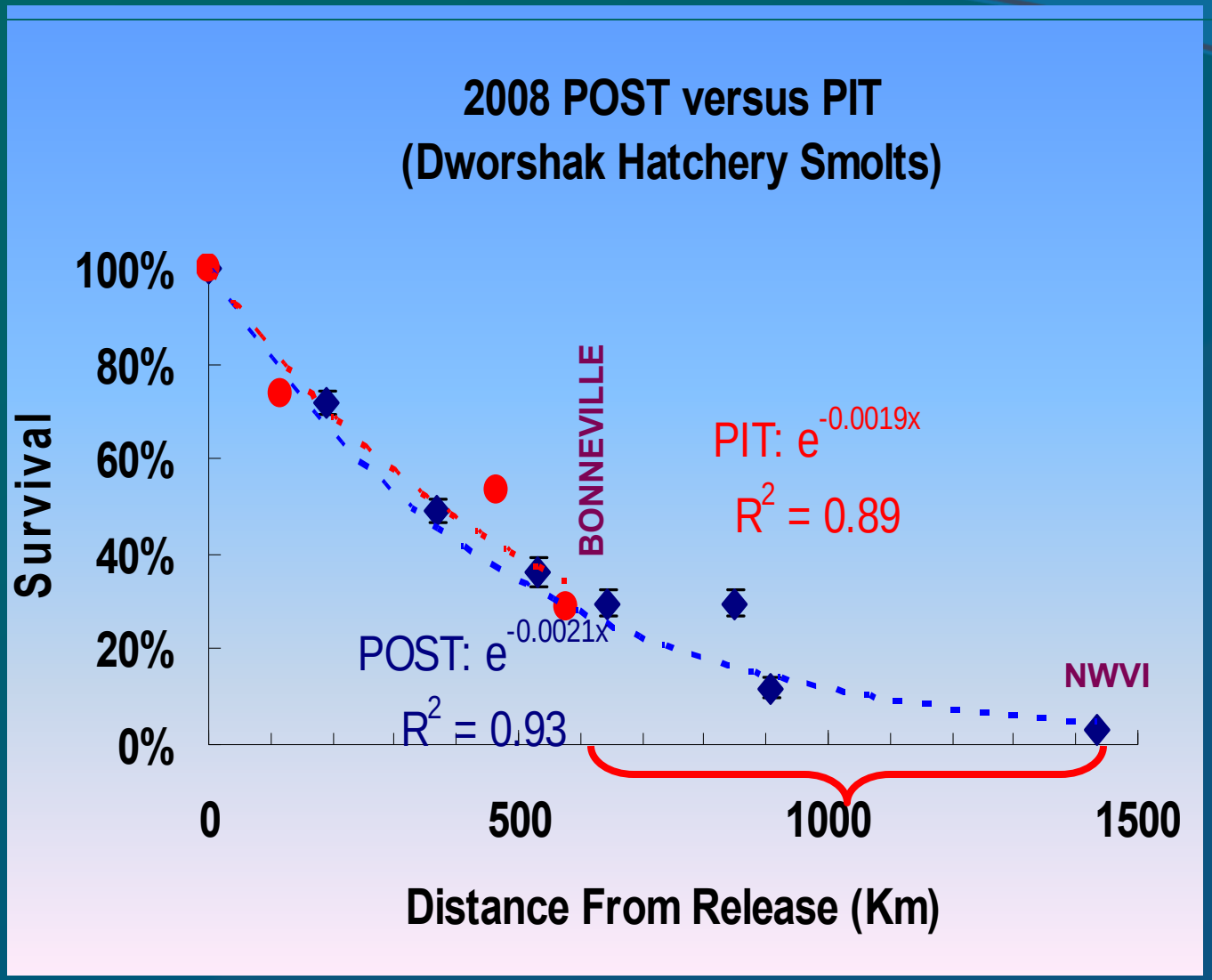




2008: Relative In-river Survival of PIT & POST Tags

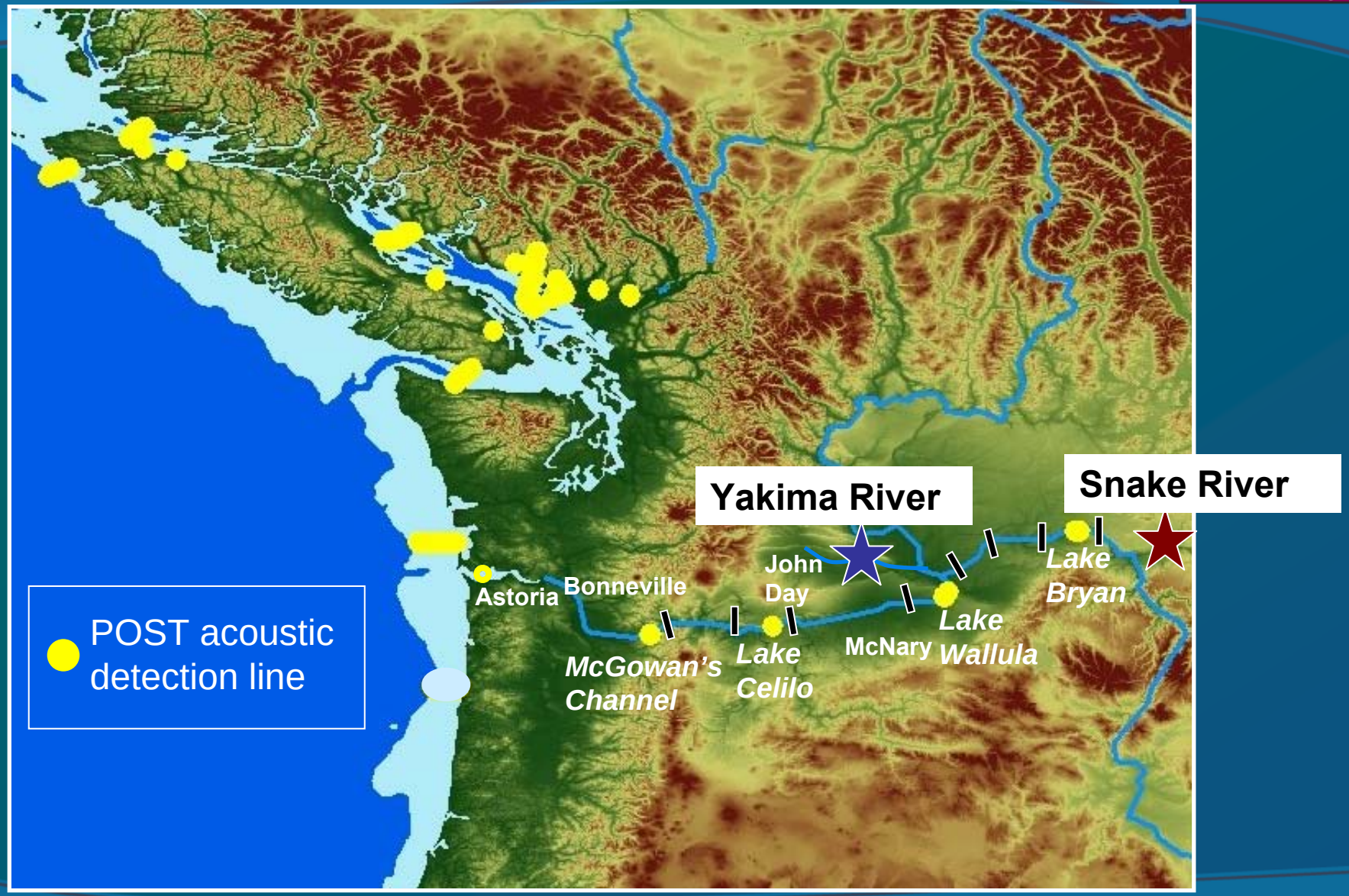
Kintama Research

** As in 2006 (V9 tags), 2008 (V7) study yielded the same survival rates as PIT tags, for the size range of smolts studied (>130mm).*



2. Delayed Mortality

Kintama Research



Delayed Mortality

Kintama Research

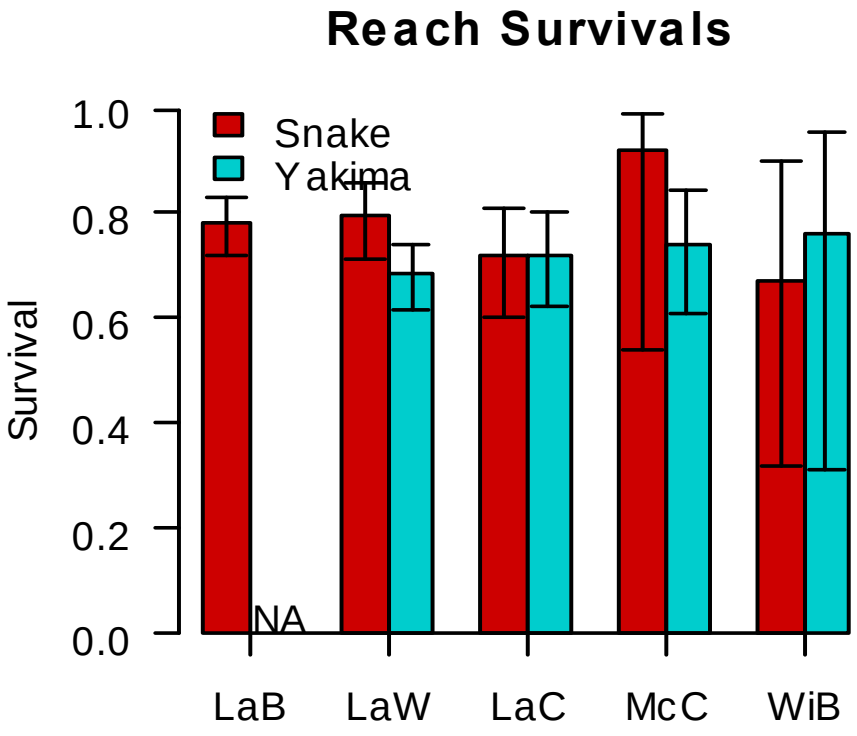
- Snake River- Dworshak Hatchery
  - Low adult return rate
    - 0.61%*
    - 8 yr average
    - LGR-LGR
  - 8 dams
  - 870 km to Columbia River mouth
- Yakima River- Cle Elum Hatchery
  - Higher adult return rate
    - 2.8%*
    - 6 year average
    - Chandler-Yakima mouth
  - 4 dams
  - 615 km to Columbia River mouth

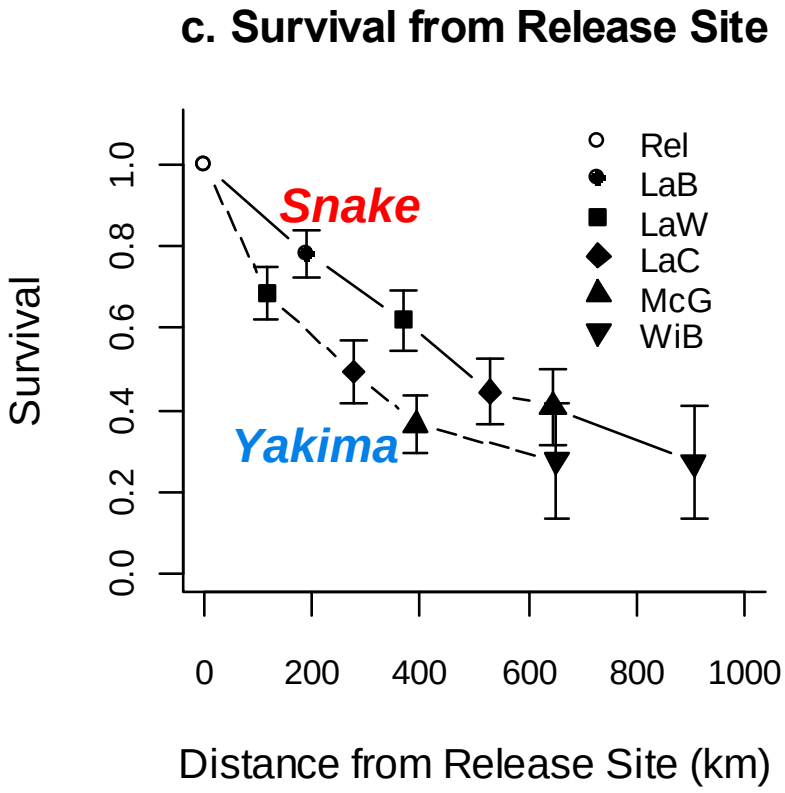
* Comparative Survival Study

*Yakima/Klickitat Fisheries Project Monitoring and Evaluation Annual Reports

Differential Mortality 2006 Results- Reach Specific Survivals

Kintama Research

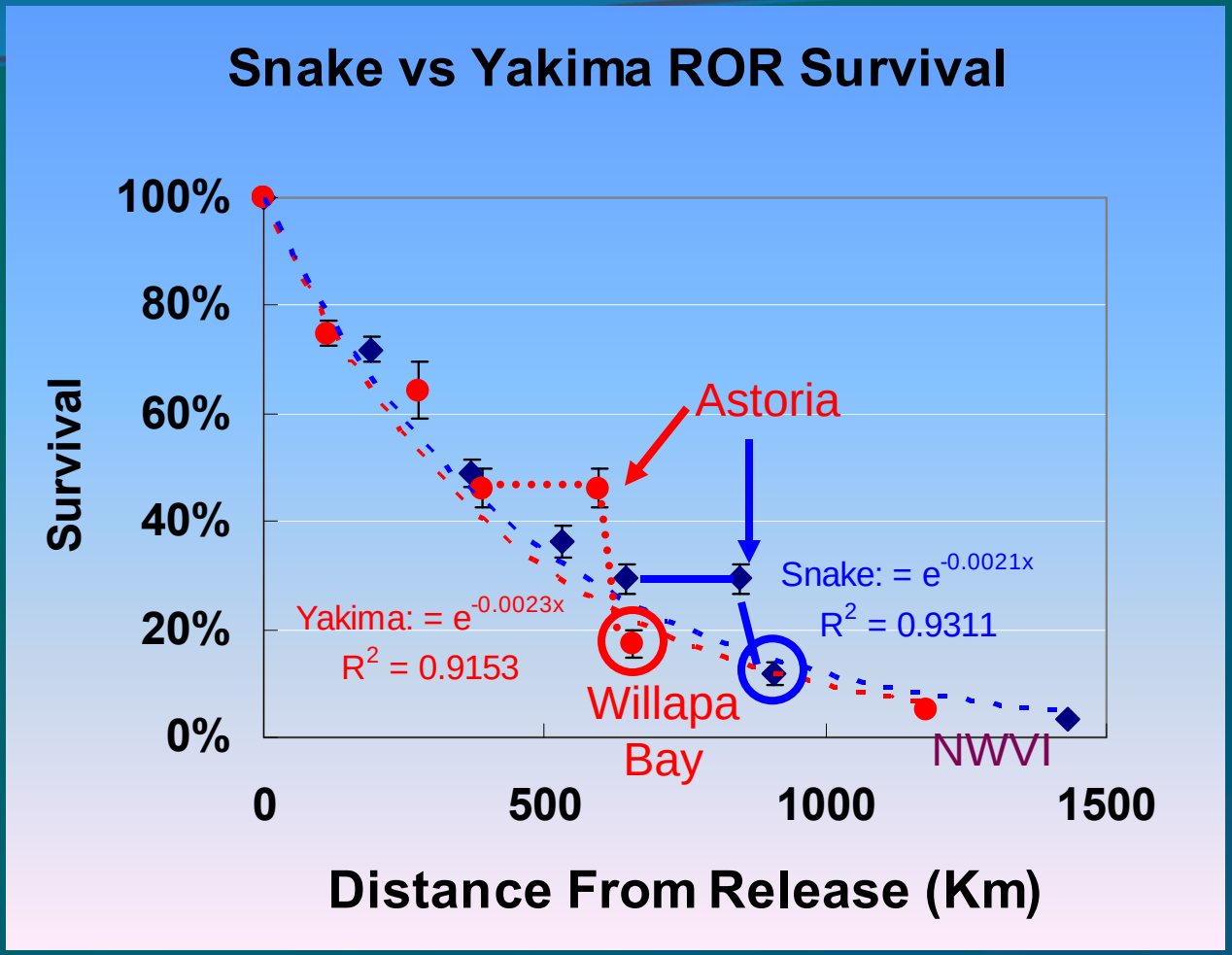




- *Survival between listening lines nearly identical for both populations*
- *When scaled by distance travelled, Snake R smolts had better survival in 2006*
- *2006 SARs about 7X better for Yakima (based on 2008 adult returns of 2 ocean)*

Differential Mortality 2008 Results- Cumulative Survivals

Kintama Research



- *Survival of both stocks nearly identical as far as N Vancouver island, despite historically poorer Snake R SARs*
- *One smooth survival curve describes survival rates- freshwater & ocean*
- *Two breaks from trend:*
- *1) 100% Survival from Bonneville to Astoria*
- *2) Sharp drop in S from Astoria to Willapa Bay*

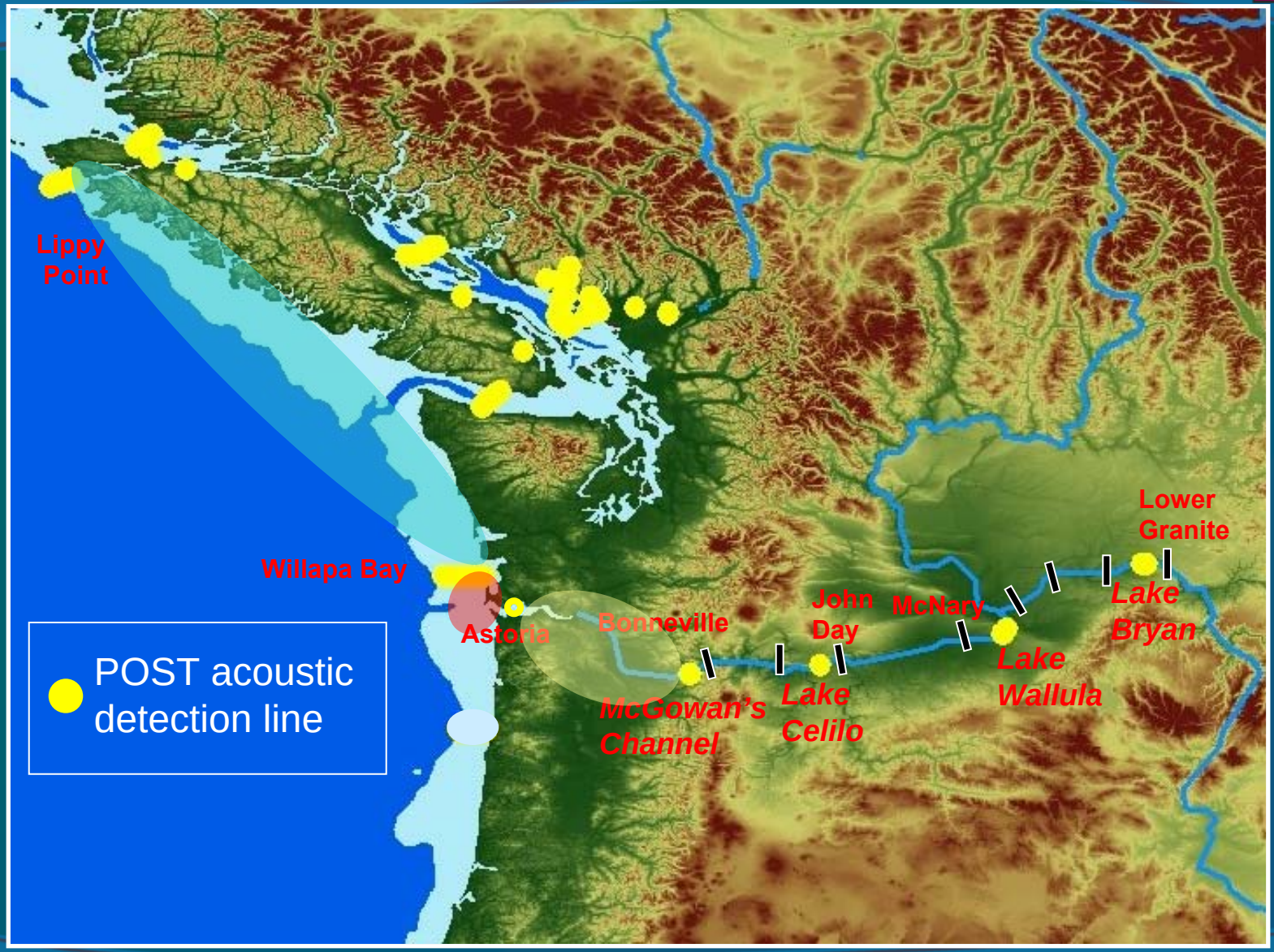
3) Transport

Kintama Research

- Return of barged (transported) smolts doesn't seem to live up to its promise
  - Protecting smolts from the 50% in-river mortality to Bonneville doesn't double adult returns– Why not??
  - Are smolts "disoriented" or otherwise compromised?

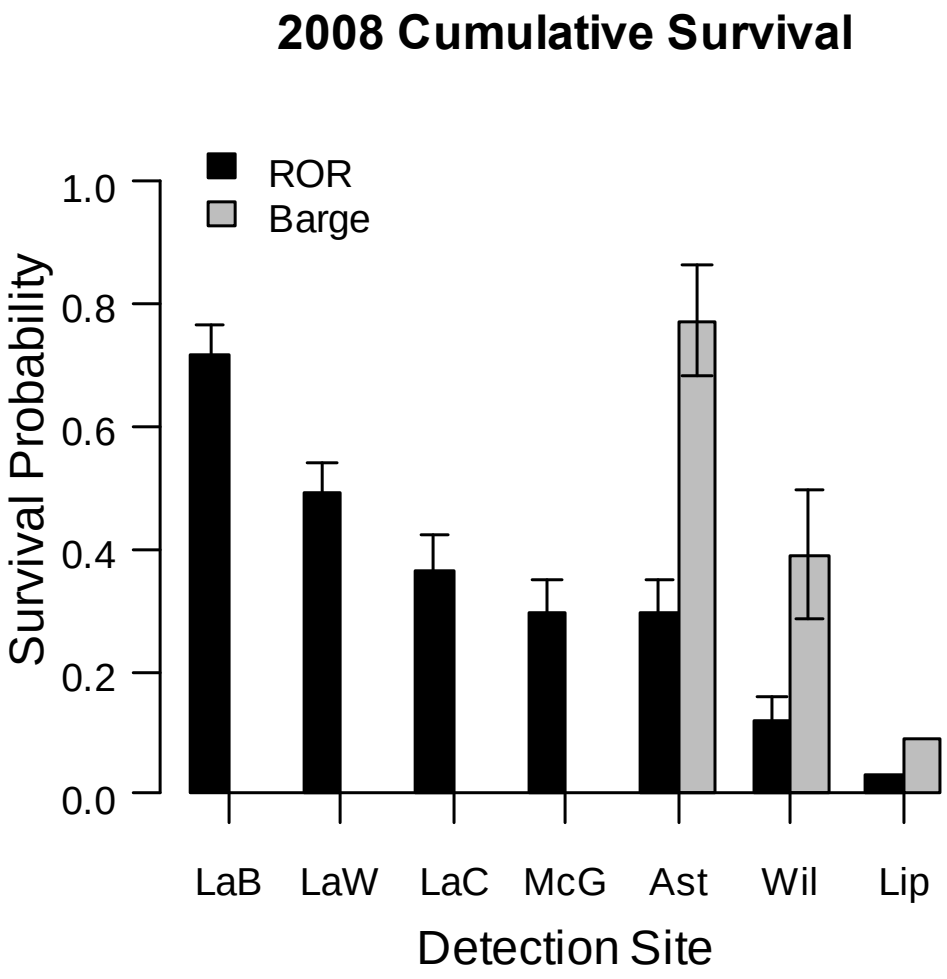
POST Arrays

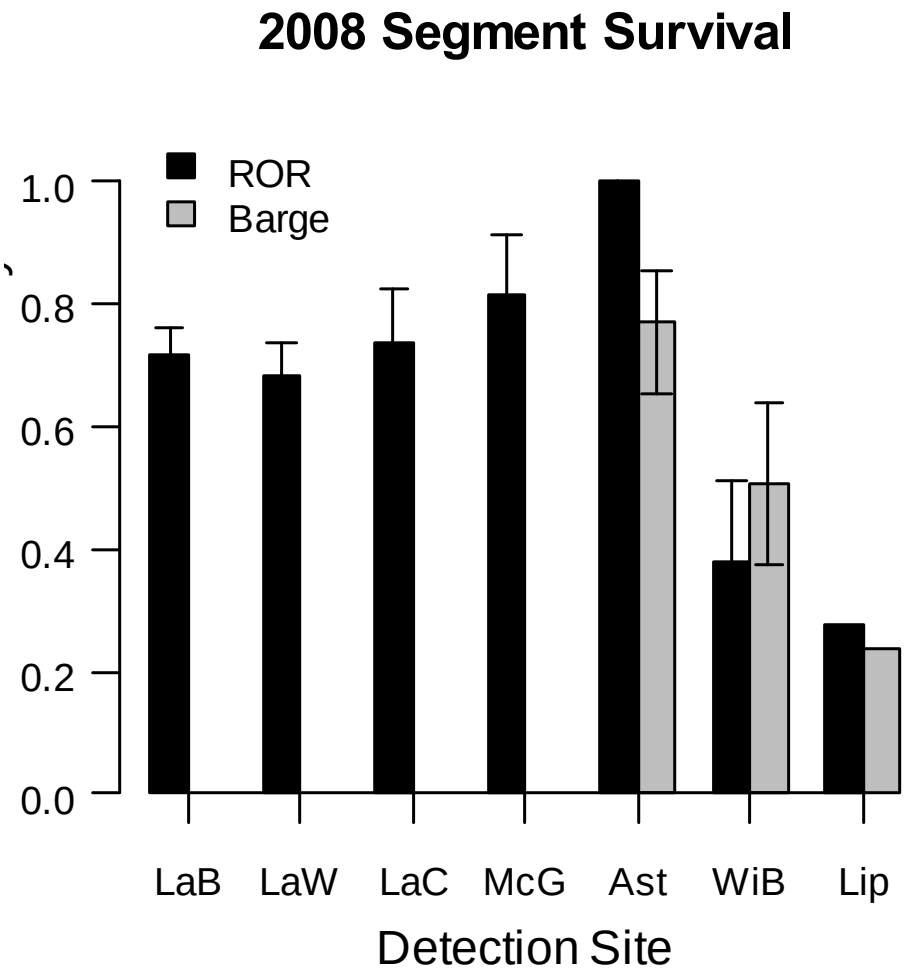
Kintama Research



2008 Snake R ROR v Transport POST Survivals

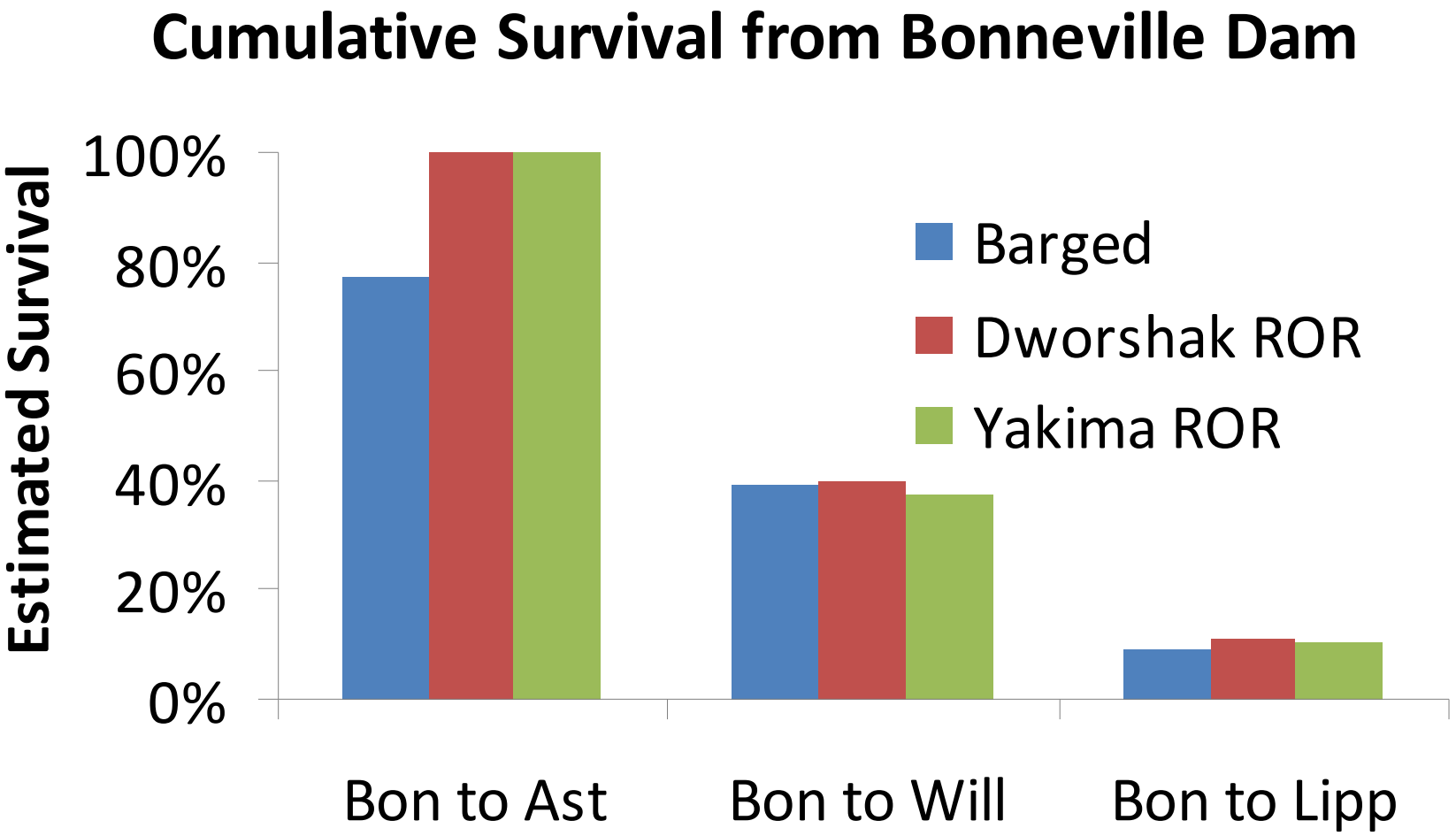
Kintama Research





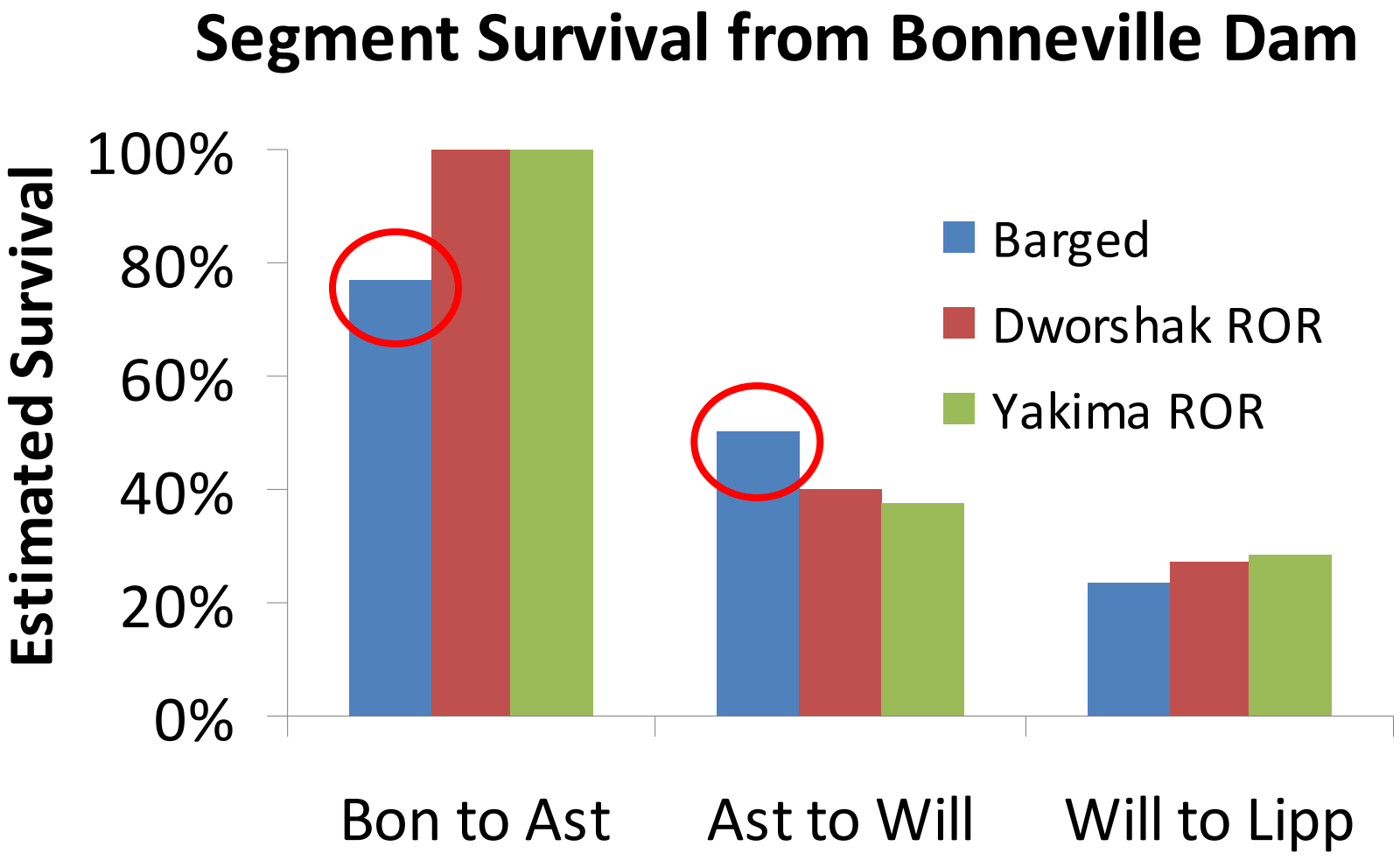
2008 Transport v ROR Cumulative Survival

Kintama Research



2008 Transport v ROR Cumulative Survival

Kintama Research



Conclusions

Kintama Research

1. **NOAA PIT & POST tags give indistinguishable survival estimates in 2006 & 2008.** *(2007 equivocal)*
2. **Measured in-river survival *rates* (S/km) appear to be roughly the same above & below the hydrosystem**
3. **Survival in the ocean is not necessarily better than in the hydrosystem (and may be worse)**
4. *(Problems in 2007 prevent clear comparison)*

Conclusions (2)

Kintama Research

1. **2008 Bonneville to NW Vancouver Island Survivals:**
    1. **Snake Barged: 9.3% (Note typo in abstract)**
    2. **Snake ROR: 11.0%**
    3. **Yakima ROR: 10.7%**
2. **Snake ROR, Yakima ROR, & Snake Barged smolts all show same "*Below Bonneville*" survival → Neither Delayed nor Differential mortality expressed by Vancouver I.**
3. *The inability of transport (barging) to improve adult returns likely occurs because transport moves smolts between two environments with similar rates of survival*

Kintama Research

OCEAN TRACKING NETWORK

Thanks to all the people who worked on this!!

BPA

CENSUS OF MARINE LIFE

Canada Foundation for Innovation

Fondation canadienne pour l'innovation

Gordon and Betty MOORE FOUNDATION

Creating positive outcomes for future generations.