

Tagging considerations for adult and juvenile Pacific lamprey

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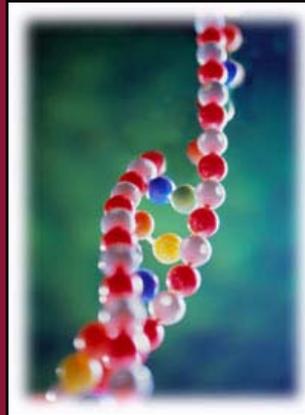
U.S. Department of the Interior
U.S. Geological Survey



Plight of the lamprey



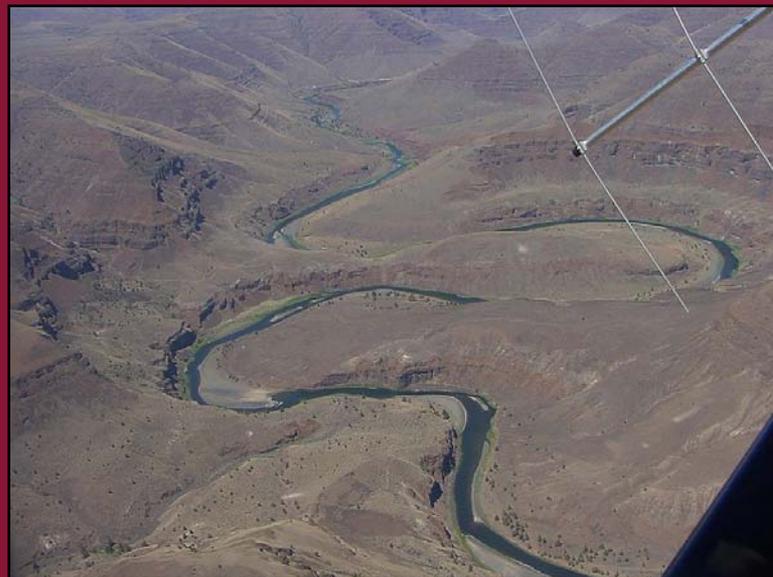
Problems



Solutions



Adults—telemetry studies



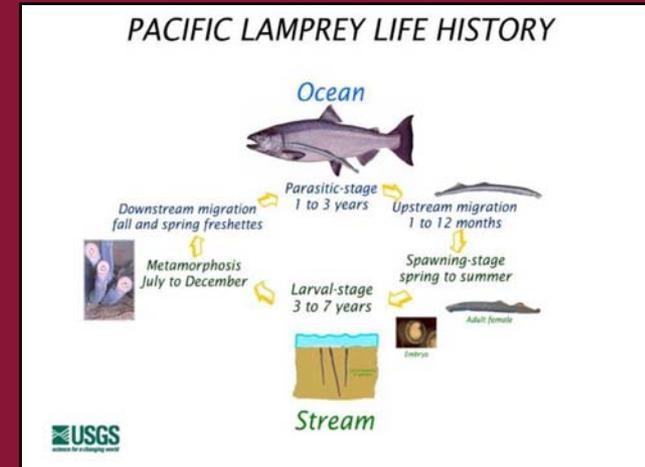
Over 5,000 lampreys surgically tagged in field and lab studies



“Standardized”
protocols
in place

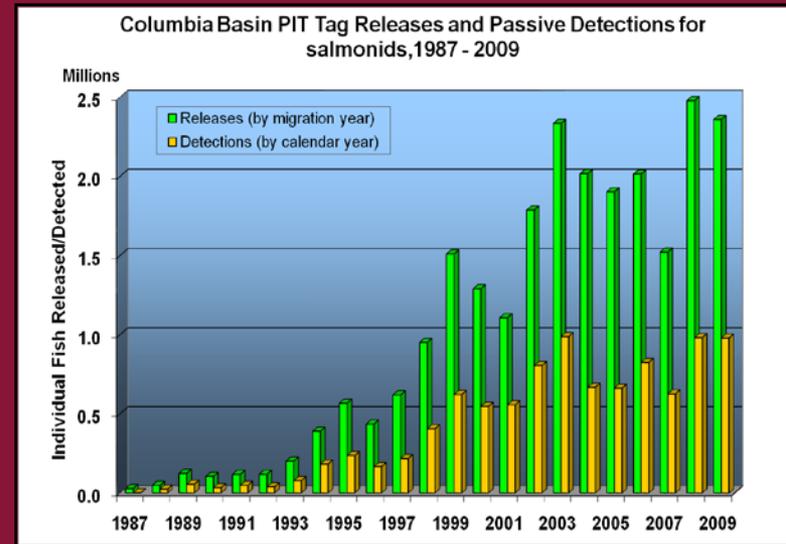


Short-term tag
effects
evaluations



No long-term
evaluations

Juveniles—PIT tag studies





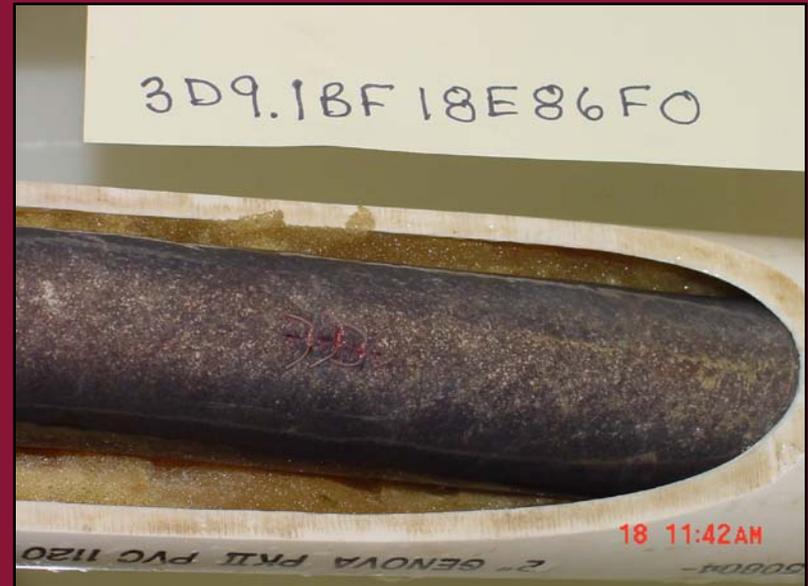
Long-term effects of surgically implanting radio tags in lampreys

How long does it take for incisions to heal?

What are the effects of substrate on the integrity of sutures and incisions

Do incisions become infected?

Can fish carry a tag to sexual maturity?



Experimental design

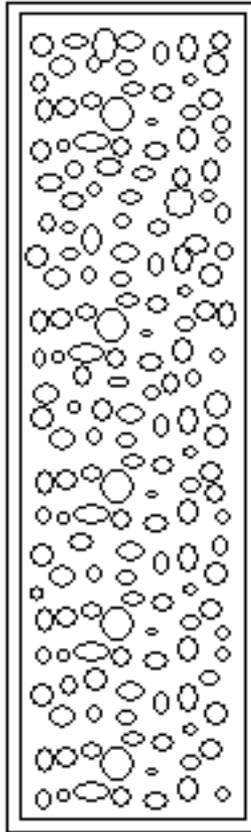
10 tagged + 10 control
lampreys per raceway

August 2006 through
June 2007

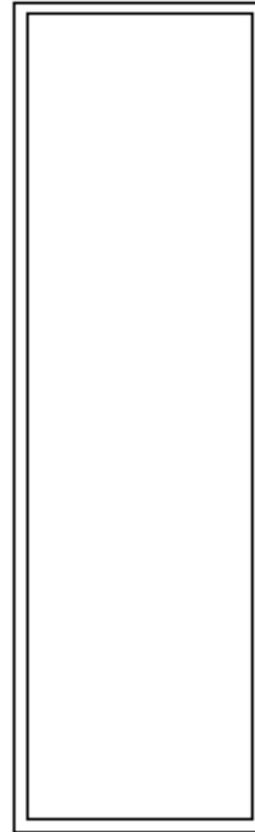
Columbia River water

Seasonal water
temperature
variations (6-23 C)

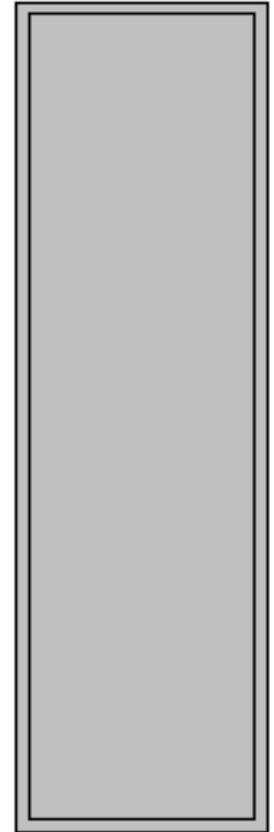
Cobble



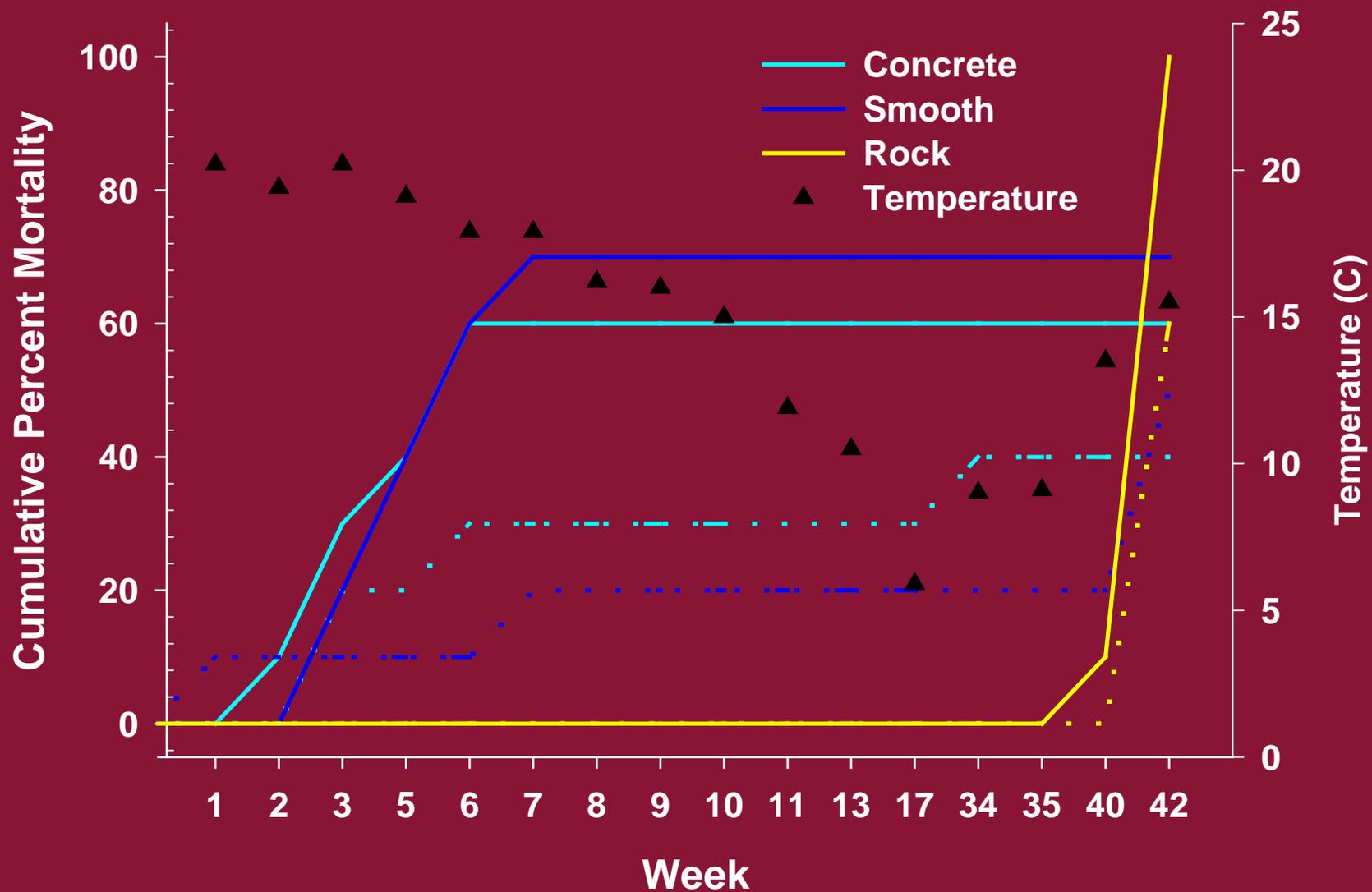
Smooth



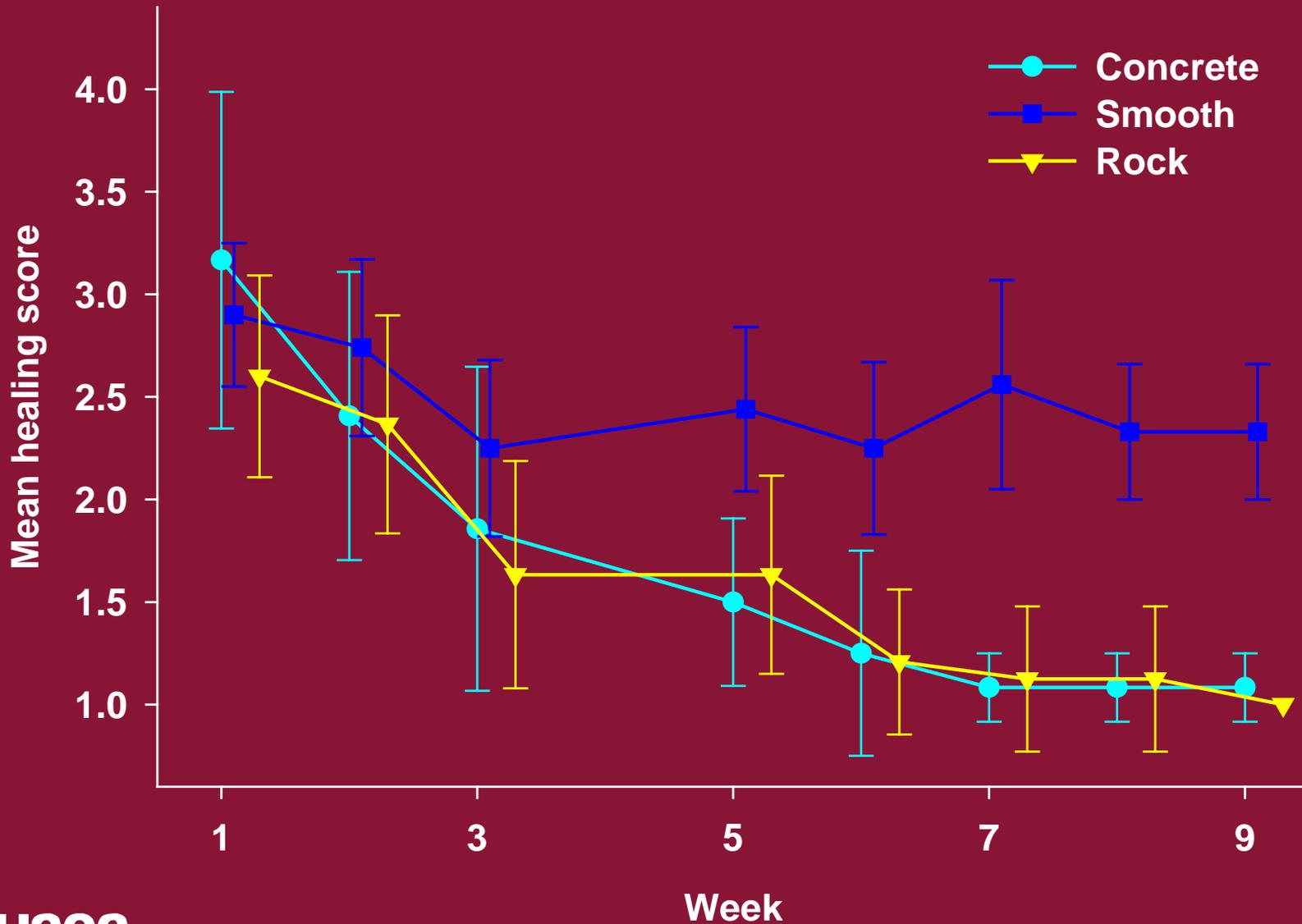
Concrete



Mortality



Healing



Sutures delayed healing

At 21 days post tag implantation:



Lost sutures < 7 d



Lost sutures <14 d



Lost sutures >21 d

No tag expulsion occurred

Future research

- Suture-less incisions? Works better in eels
- Fast absorbable sutures at cold temps?
- Realistic holding conditions: temperature, substrate, pathogens etc.
- Greater sample sizes and replication





Can we PIT tag juvenile lampreys?

- Safe, effective, efficient
- Challenging to capture, handle, and hold
- Physiologically delicate fish = “smolts”
- Tag : body diameter ratio



Research goal

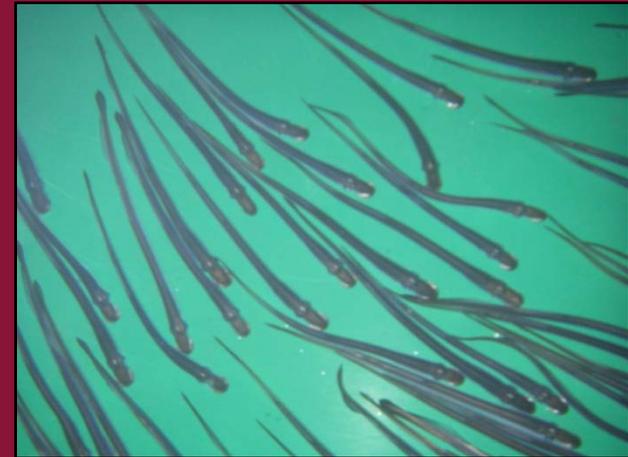
Develop a PIT tagging protocol for juvenile lampreys that is safe, effective, and efficient to increase our understanding of their life history and limiting factors



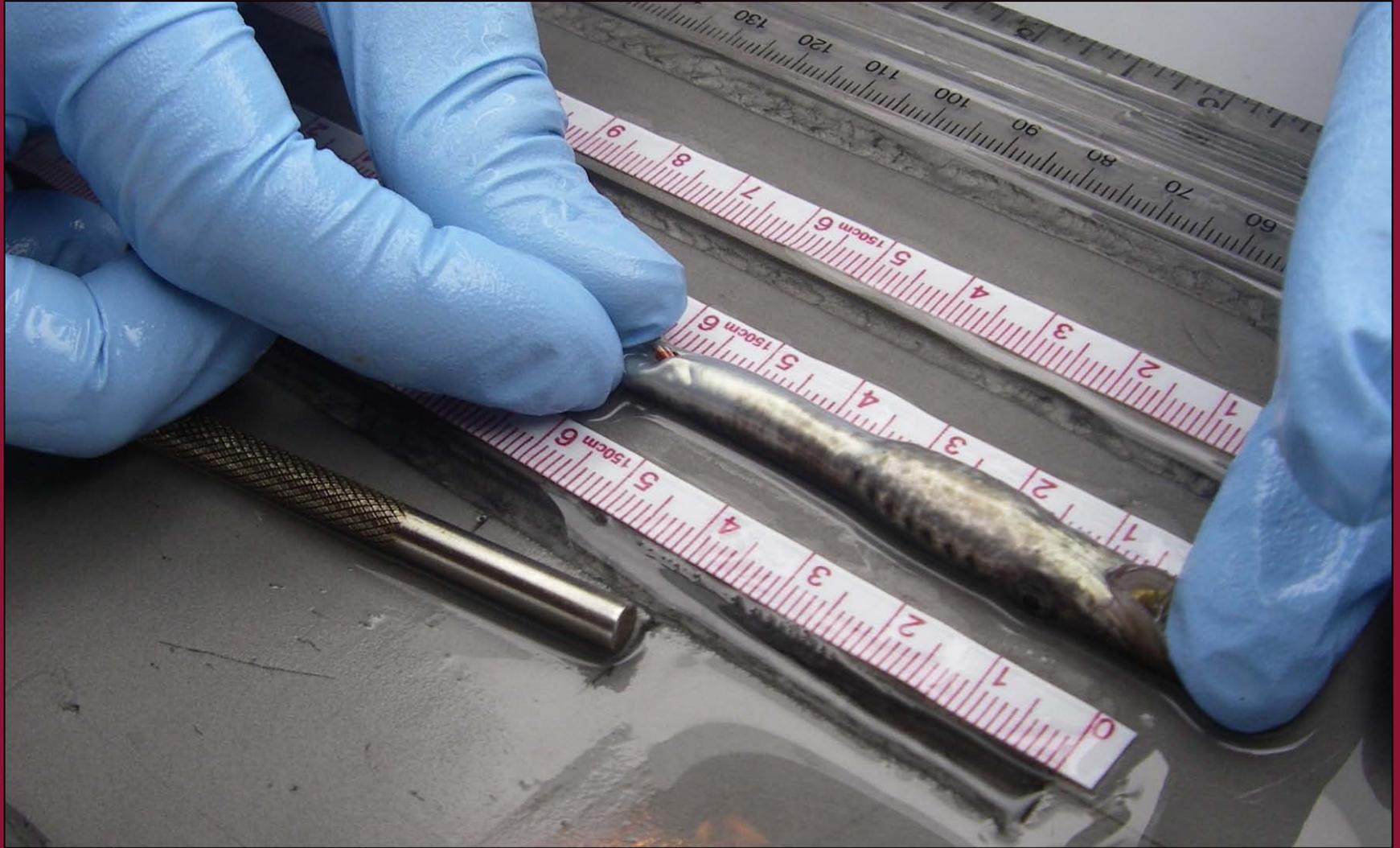
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Experimental design

- Collected Pacific lamprey from John Day Dam in June
- Three treatment groups:
 1. *3-mm incision on mid-ventral (MV) line (no sutures)*
 2. *Incision right lateral to the MV line*
 3. *Handled and anesthetized only (control)*
- PIT tags (8 x 2 x 2 mm) inserted by hand
- 60 fish/group, with 15 in each of 12 aquaria
- Held @ 12°C for 33 d
- Monitored tag retention and mortality

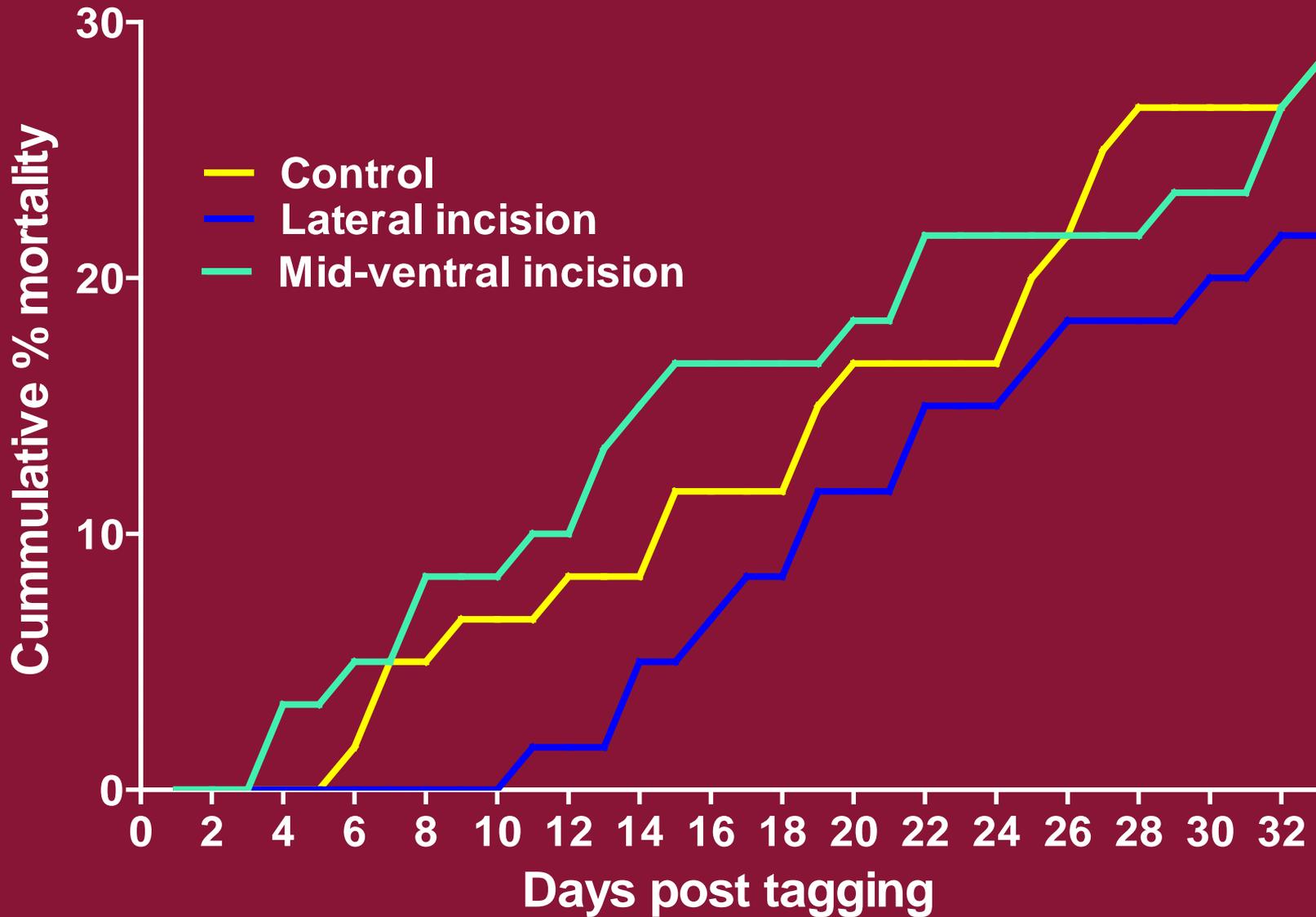


Inserting PIT tag by hand

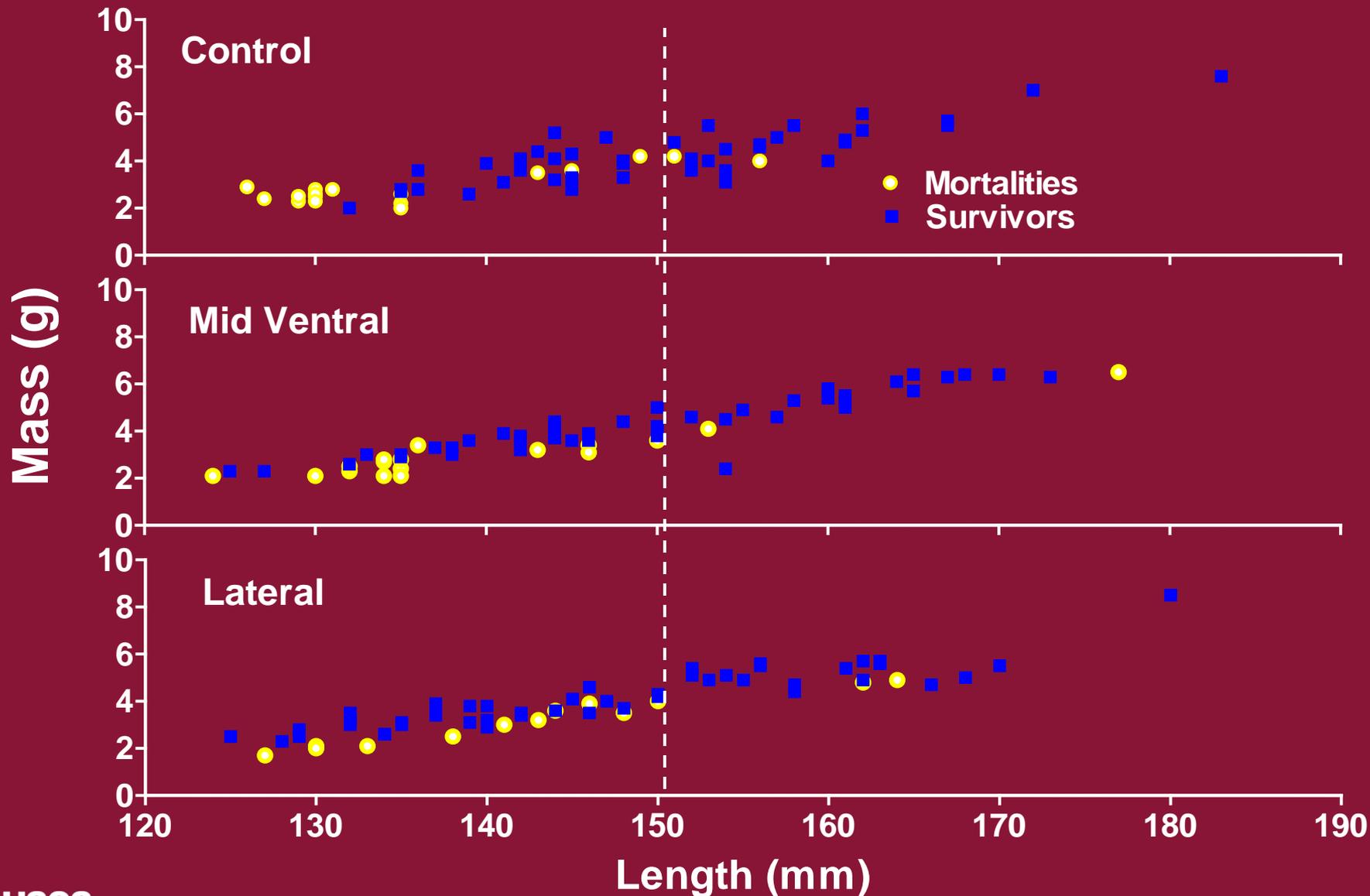




Mortality by treatment



Survival was related to size



Mortalities were related to pathogens

Aquatic fungus:

- On almost all mortalities (mouth, head, gill pores, posterior body)
- Rarely on incision

Ichthyophthirius multifiliis :

- Common fish parasite
- Found in 9 of 12 mortalities tested

Vibrio vulnificans:

- Bacteria from heart of 7 mortalities
- Rare food and water borne pathogen
- Closely related to *V. cholerae*
- Normally found in seawater



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Mortality example



Summary

- **Mortality (21-28%) over 33 d for all groups**
- **No statistical difference between groups**
- **No tag loss**
- **Mortality variable between aquaria**
- **Pacific lamprey have pathogens (obscure our results?)**



Future research

Develop temperature ranges for tagging

- *limited by outmigration timing*
- *proliferation of disease*

Minimize stress and disease outbreaks

- *Anesthetic & handling procedures*

Long term effects of PIT tagging

- *Transition to seawater*
- *Feeding and growth*
- *Smaller tags*



Thanks



Greg Kovalchuk & Dean Ballinger: PSMFC

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