Reintroduction of Pacific lamprey in the Umatilla River in Northeast Oregon

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION
Treaty of 1855
FISHERIES PROGRAM
Department of Natural Resources

Goal

- **Restore natural production of Pacific lamprey to self sustaining and harvestable levels.**

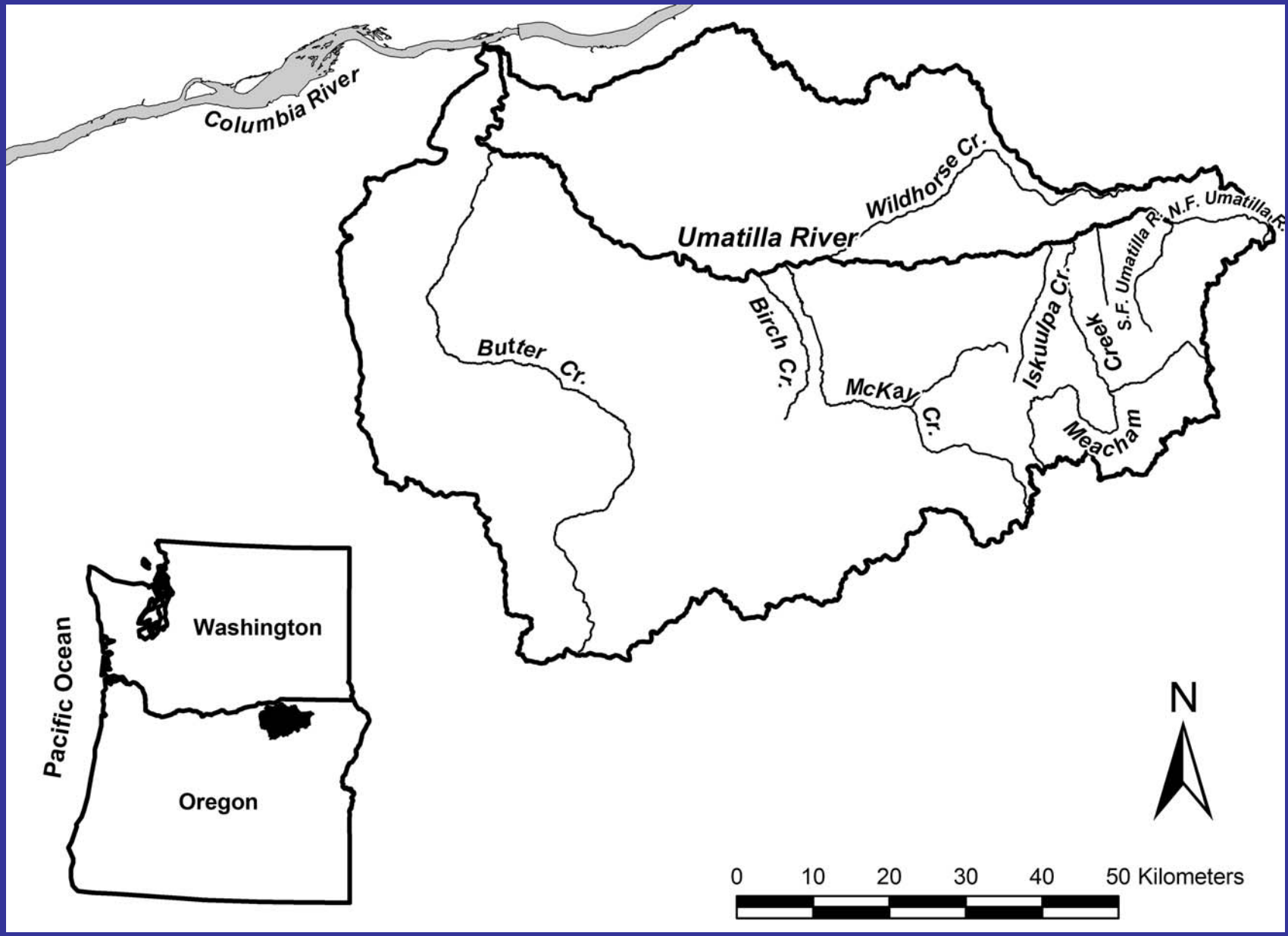
CTUIR Restoration Strategies

- Utilize translocation from geographical close donor population as immediate stop-gap action
- Supplementation/Artificial Production (currently no facilities or funding to do this)
- Habitat improvements and wait for natural re-colonization (requires successful main-stem passage)

Case study

- Before and after translocation study in the Umatilla River.
- Case study sampling began in 1998, followed by adult lamprey translocation in 2000.
- Can translocated adult lampreys increase natural production and restore self-sustaining and harvestable levels of lampreys?

Study Area


Columbia River
Wildhorse Cr.
Umatilla River
N.F. Umatilla R.
S.F. Umatilla R.
Iskuulpa Cr.
Creek
Birch Cr.
Butter Cr.
McKay Cr.
Meacham
Pacific Ocean
Washington
Oregon
N
0 10 20 30 40 50 Kilometers

CTUIR Translocation Plan

- Trap and collect 500 adult lamprey at mainstem dams during summer adult up-migration
- Transfer and maintain adult lamprey at SF Walla Walla Holding Facility till winter
- Transfer and maintain adult lamprey at Minthorn Springs Adult Lamprey Holding Facility in late winter
- Translocate adult lamprey in Umatilla River and selected tributaries in spring (May)
- Monitor all life stages to determine translocation success

Policy Approval of Plan

- Part of Umatilla Basin lamprey restoration plan approved by CTUIR and NPCC
- Part of CTUIR MOA lamprey research and restoration project
- Translocation follows guidelines established by the CBFWA Lamprey Technical Workgroup and the 4 Tribes

Translocation Guidelines

- Lamprey formerly abundant in Umatilla based on tribal and non-tribal oral histories
- Extensive flow and habitat enhancements throughout basin, structural improvements ongoing
- Pre-translocation surveys determined lamprey functionally extirpated
- Since 2000, project has translocated an average of 1% of the Bonneville count, continued collection not expected to exceed 1%
- Collection to occur at the John Day Dam; Umatilla River flows into the John Day pool

Translocation Guidelines

- Trapping to occur behind picketed lead areas
- With main-stem adult passage of about 50% and targeted individuals are “unsuccessful candidates”, more survival and production will likely result from translocating adults into the Umatilla River
- Pre-translocation disease screening by NE Oregon Fish Pathology Lab
- CTUIR Scientific Take Permits obtained

Translocation Guidelines

- Federal Authorization to proceed granted by NOAA
- Letter of access to collection sites received from US Army COE
- Translocation is followed by comprehensive Umatilla lamprey monitoring and evaluation

Translocation Plan Objectives

- **Translocation creates the means to perform the following objectives:**

  -Implement and evaluate adult holding

  -Evaluate spawning success in a natural environment

  -Evaluate juvenile rearing success

  -Evaluate juvenile outmigration success

  -Evaluate adult up-migration by radio telemetry

  -Determine adult return by mark-recapture

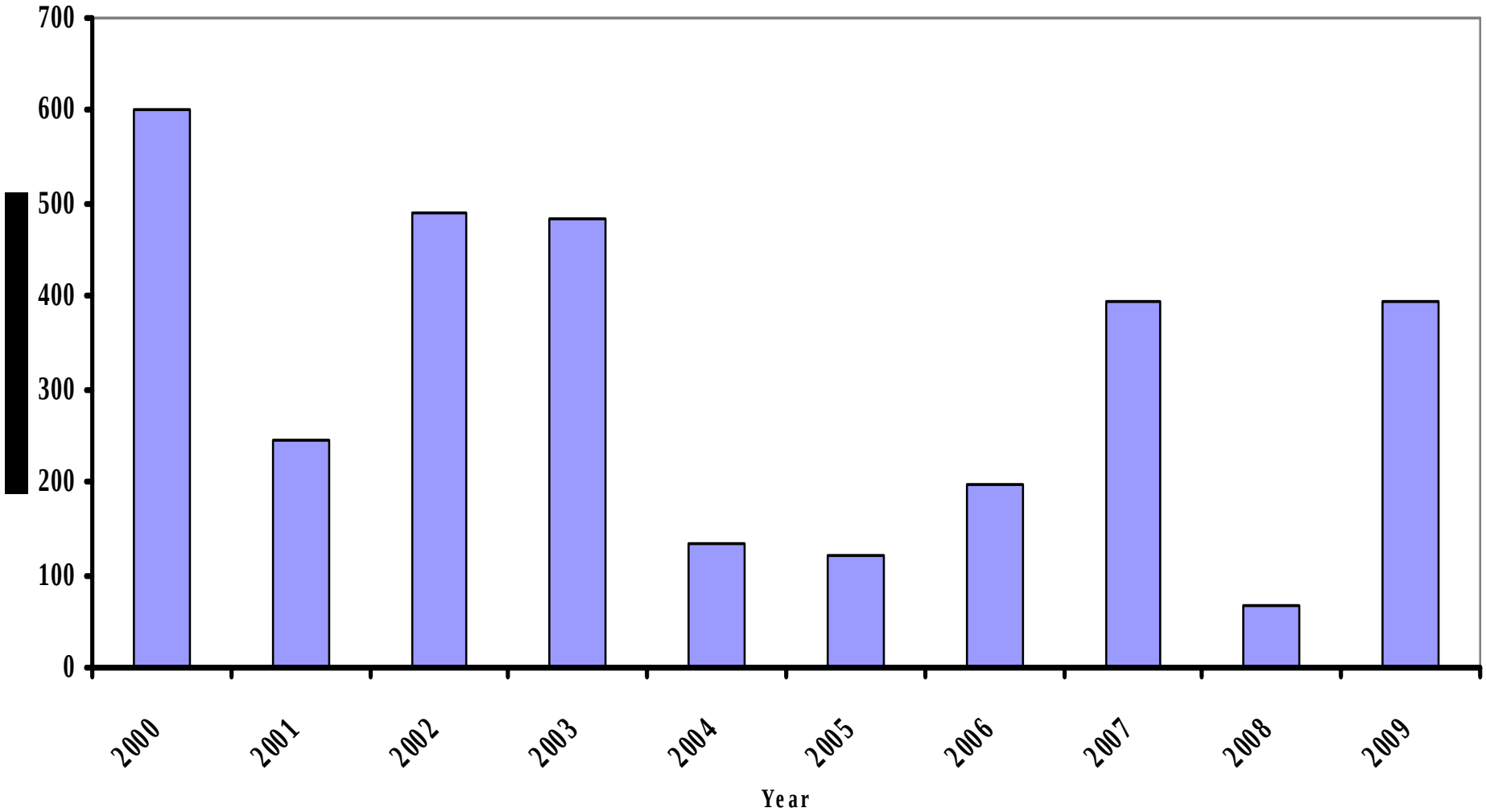
  -Evaluate lamprey passage structures

Can adult Pacific lamprey sexually mature while being held in captivity?

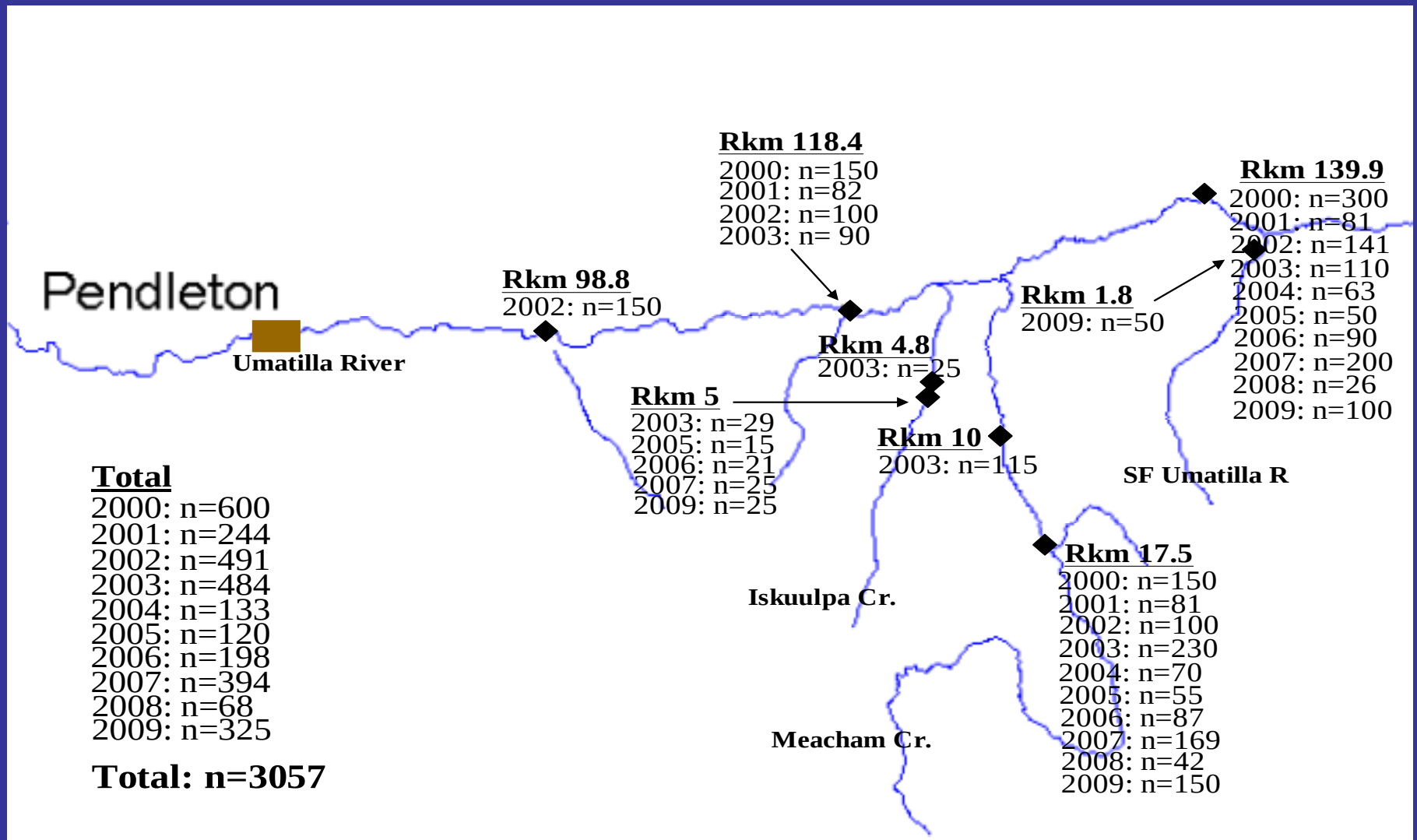
Will lampreys survive the translocation activity?

Method

Number of adult Pacific lamprey translocated



Location of Translocation

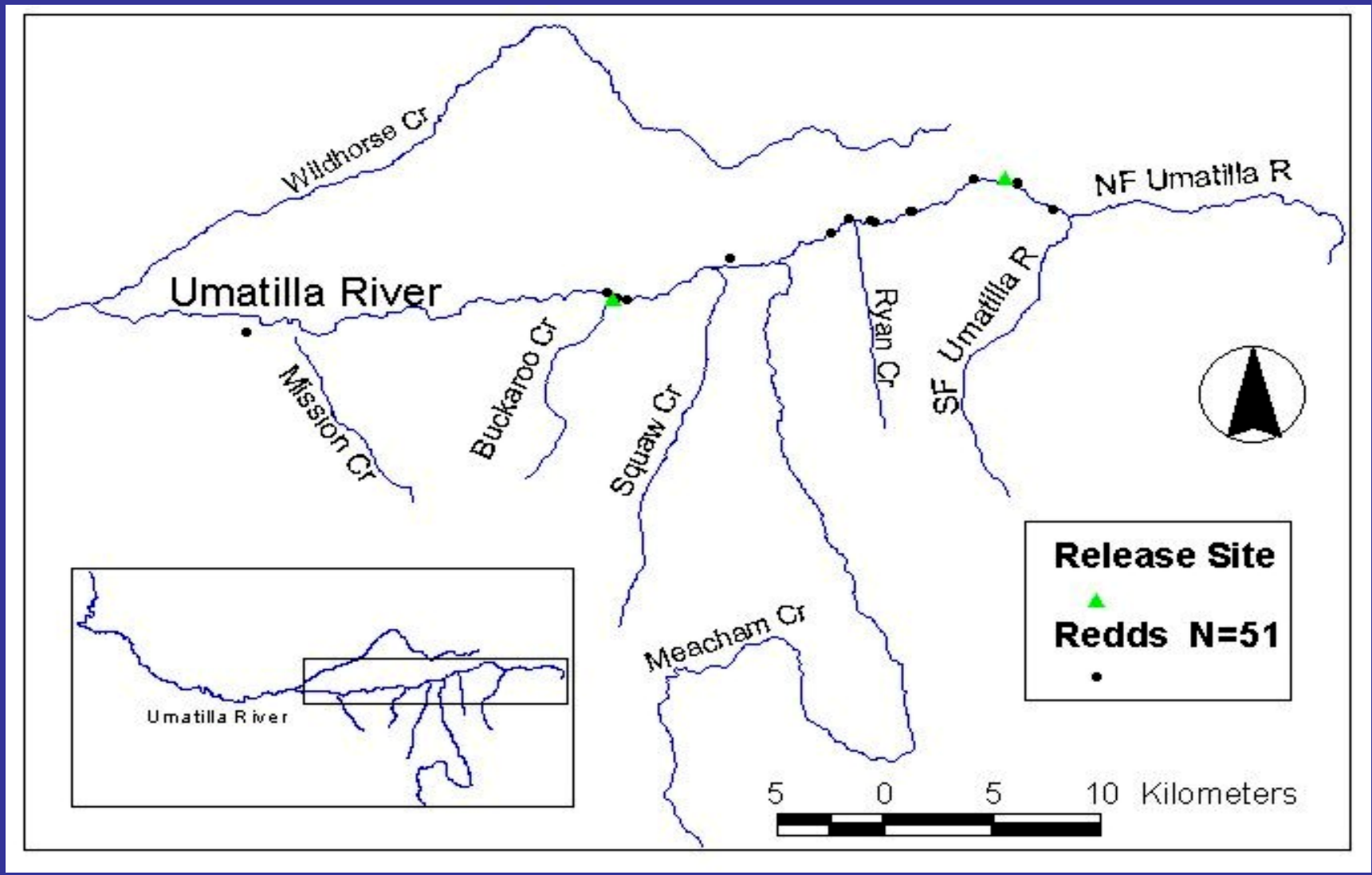


Can translocated Pacific lampreys find habitat for spawning?

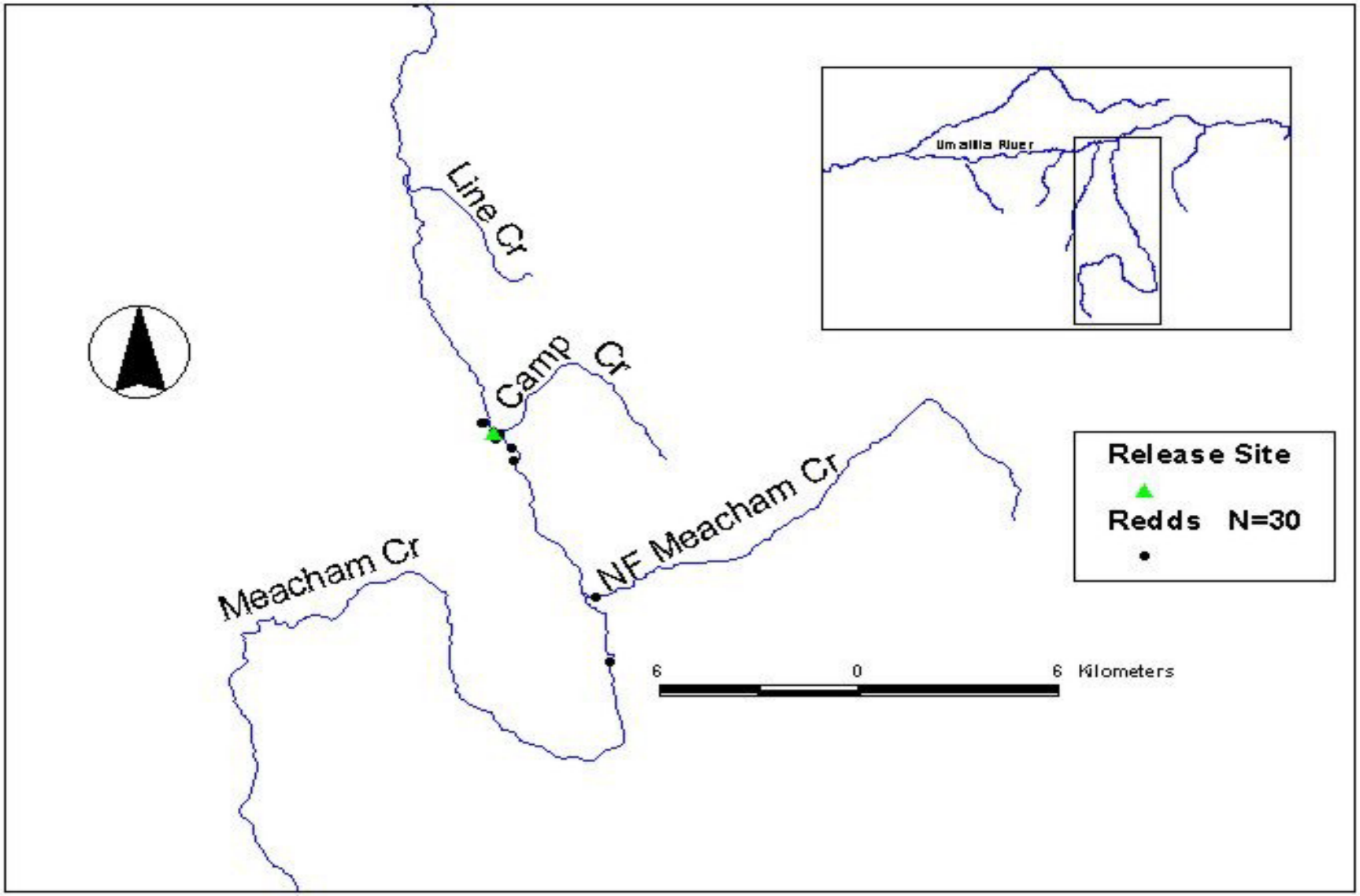
Method

- Nest surveys conducted 2000-2002, 2009
- Spot checks 2003-2008
- May - July

Umatilla River
Nest distribution (2000)



Meacham Creek
Nest distribution (2000)



Number of lamprey nests

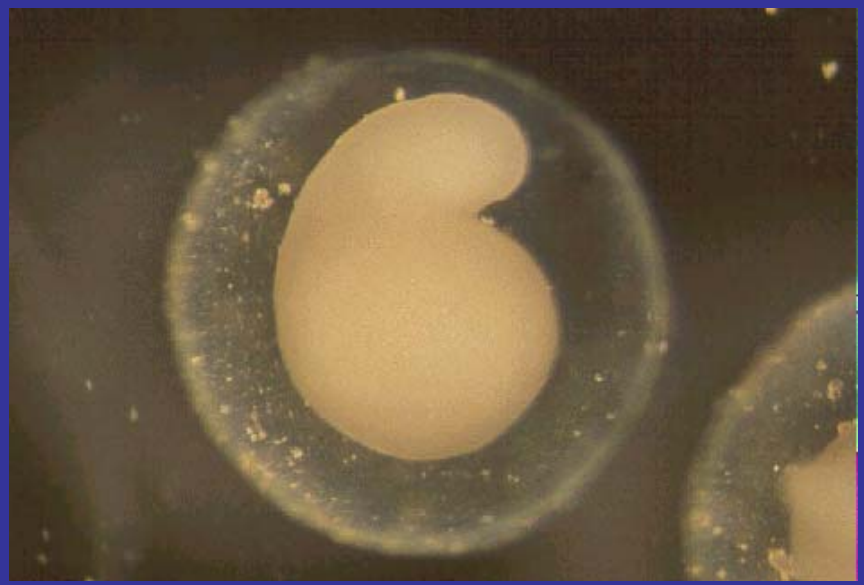
- Spawning occurs during first two weeks in June.

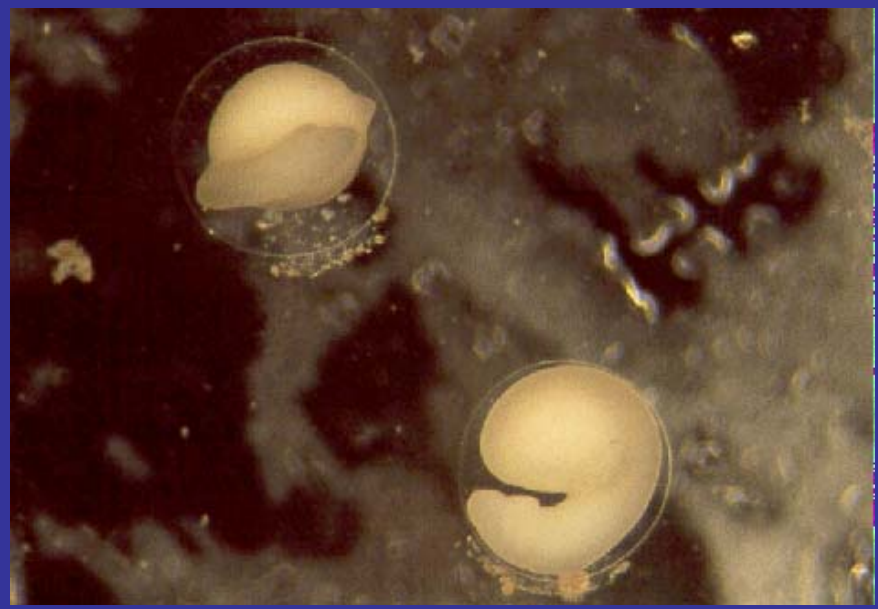
- 2000 81 nests
- 2001 49 viable nests
- 2002 67 viable nests, 118 test nests
- 2009 81 nests, 40 test nests

Can translocated lampreys reproduce?

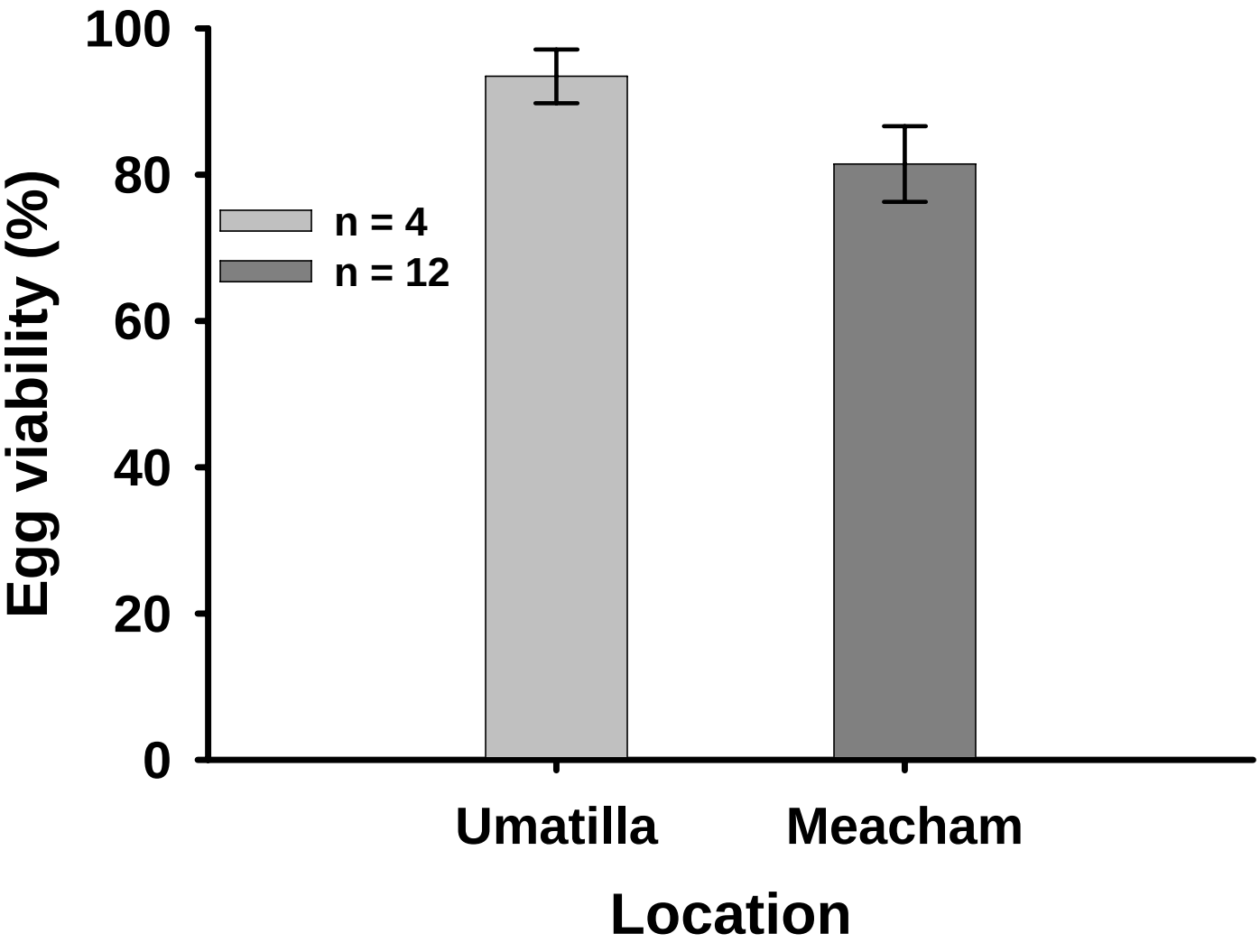
Method

- 2001 Egg viability
- Collected egg samples from Umatilla R. & Meacham Ck.
- Stages 13 – 14 endpoint





Egg viability

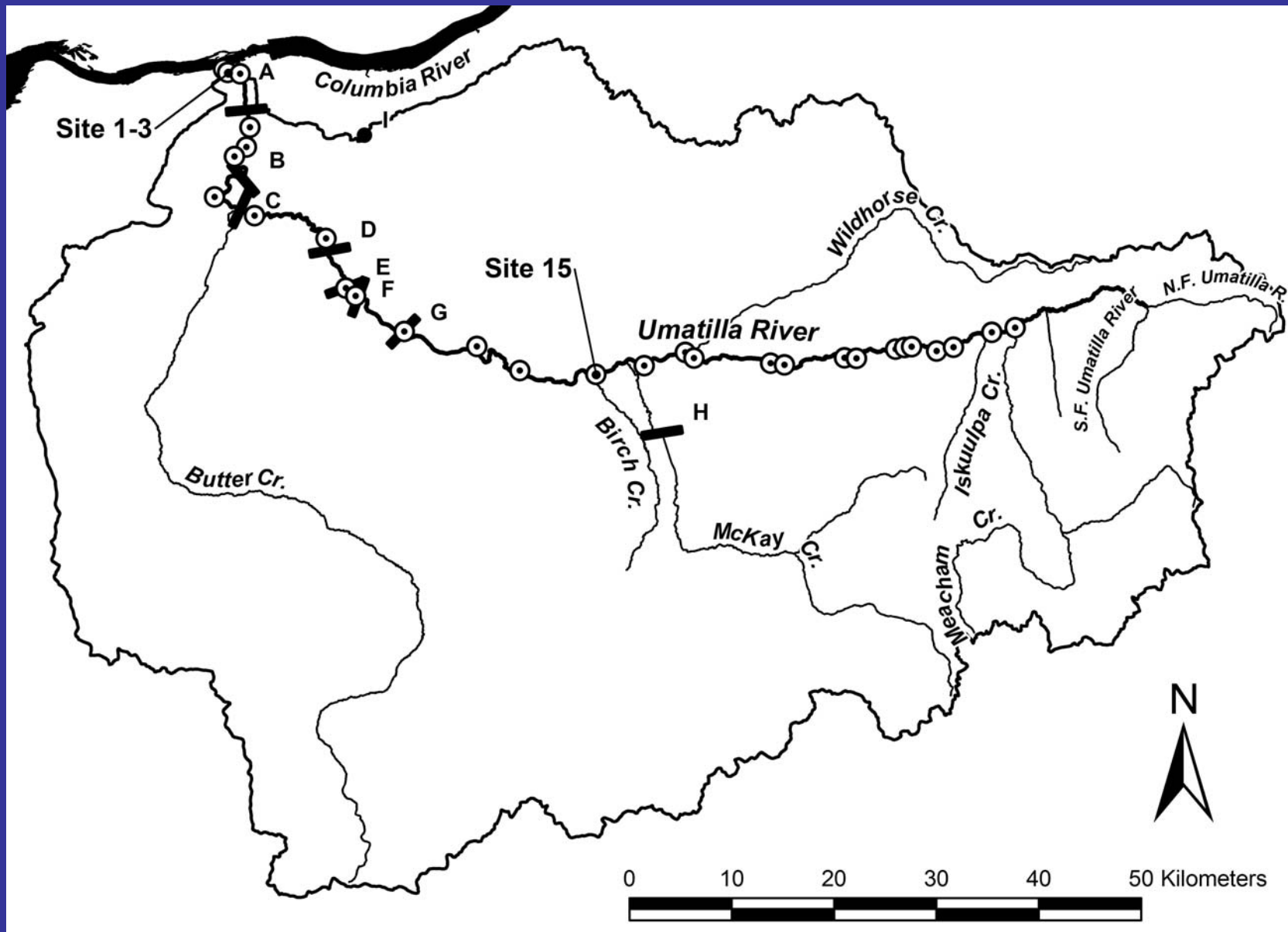


Does larval density increase after translocating adults?

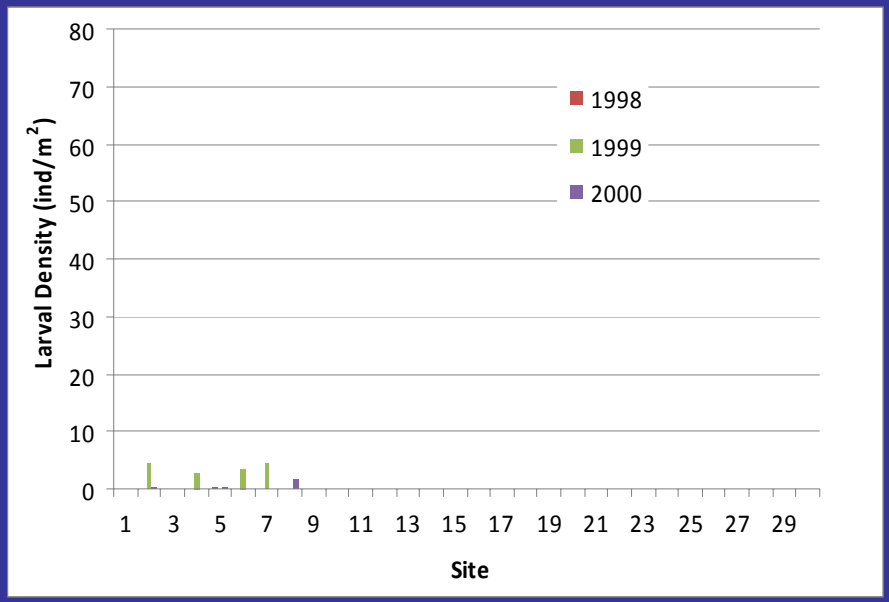
Method

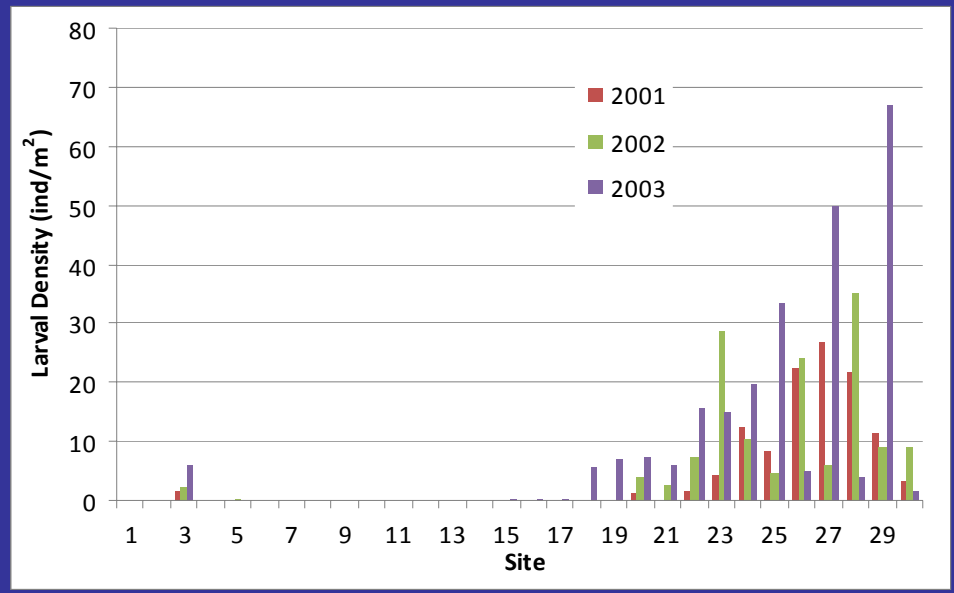
- ABP-II Electrofishing unit
- 2,3,4 pass removal method
- Sampled 30 index plots 1998 – 2008
- Repeated measures ANOVA

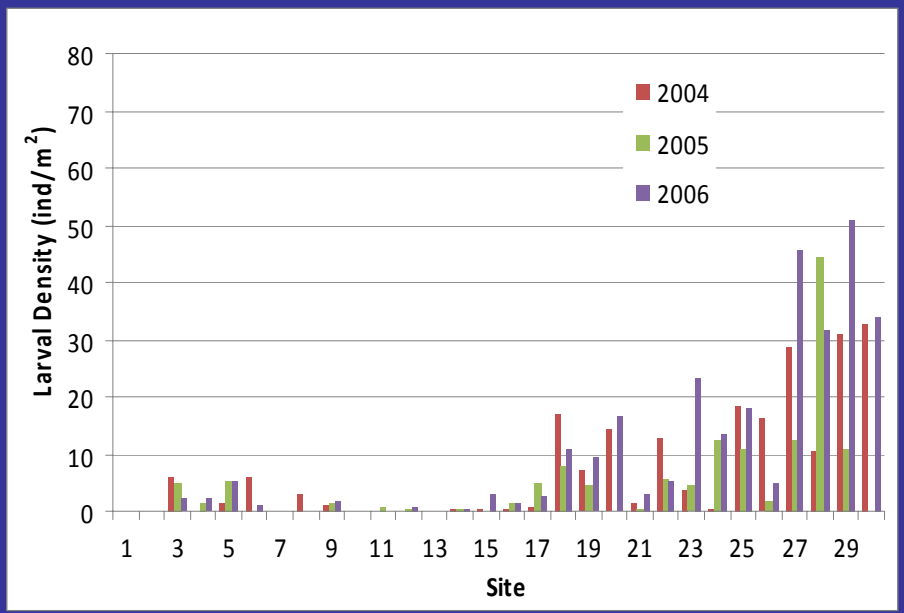
Location of index plots

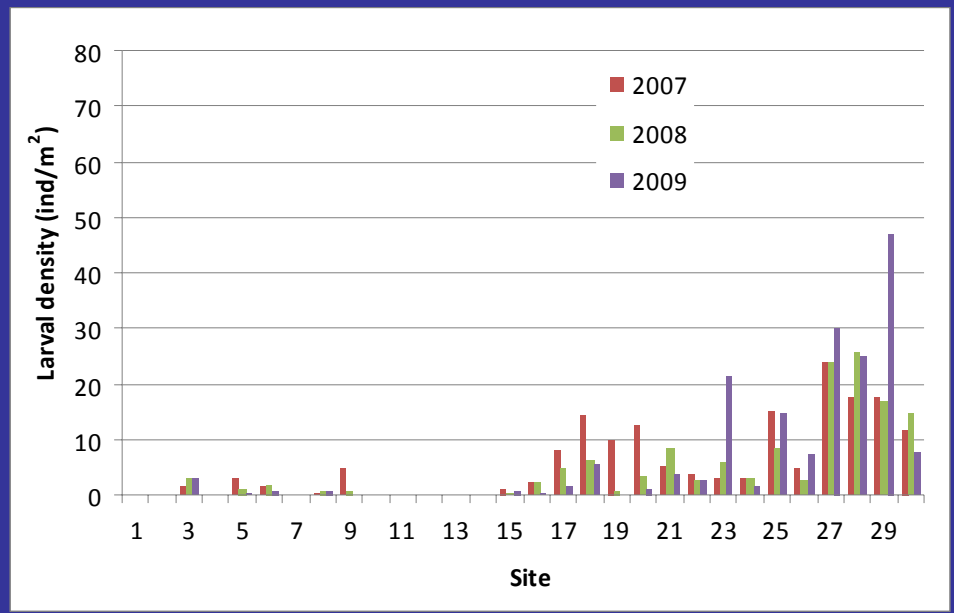


Larval distribution

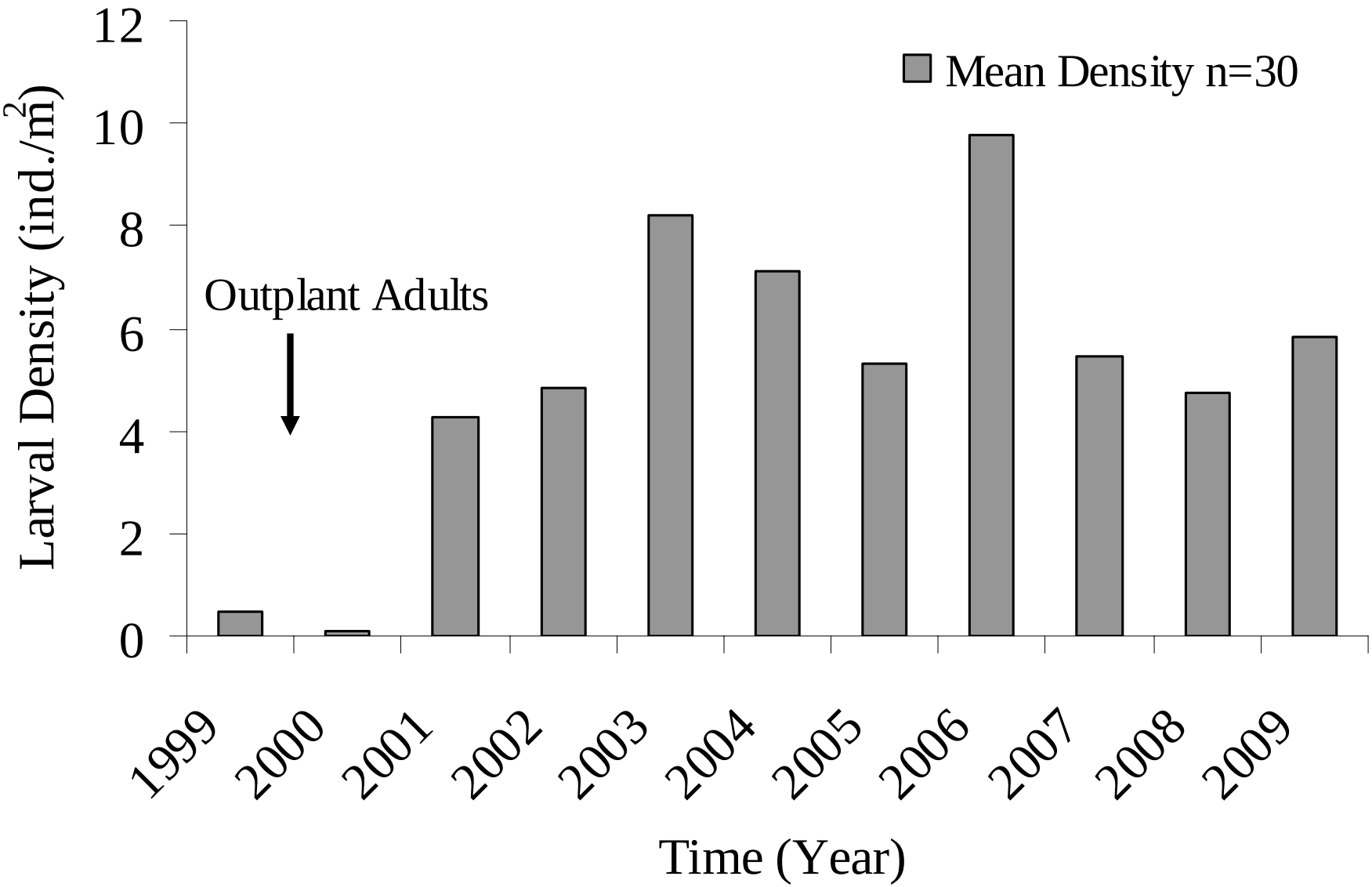




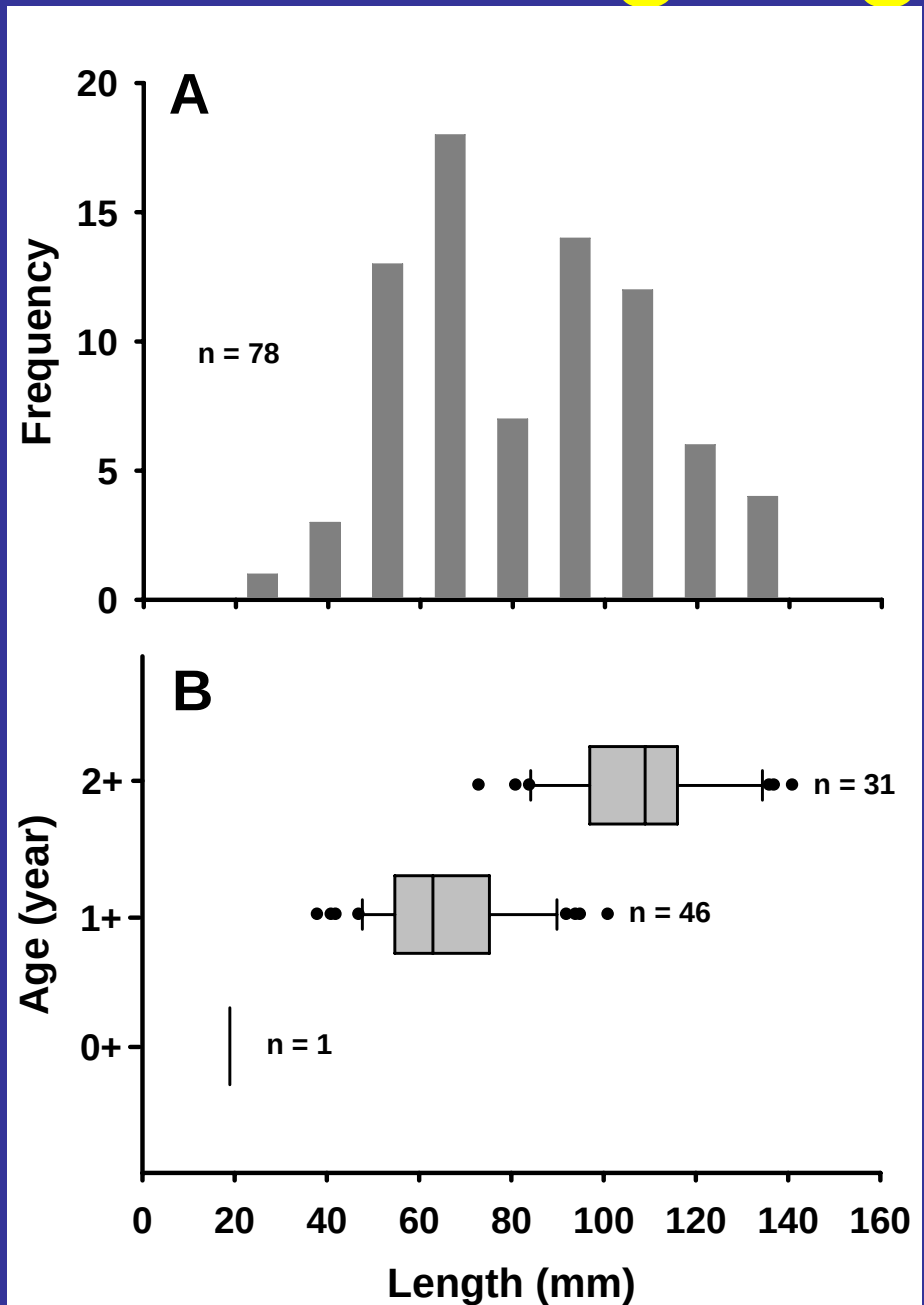




Larval density in plots



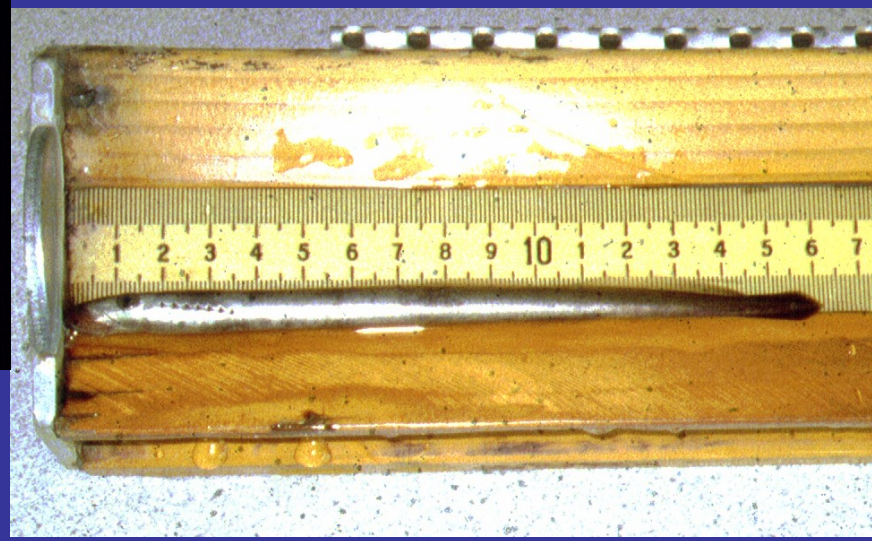
Larval statolith ageing (2002)



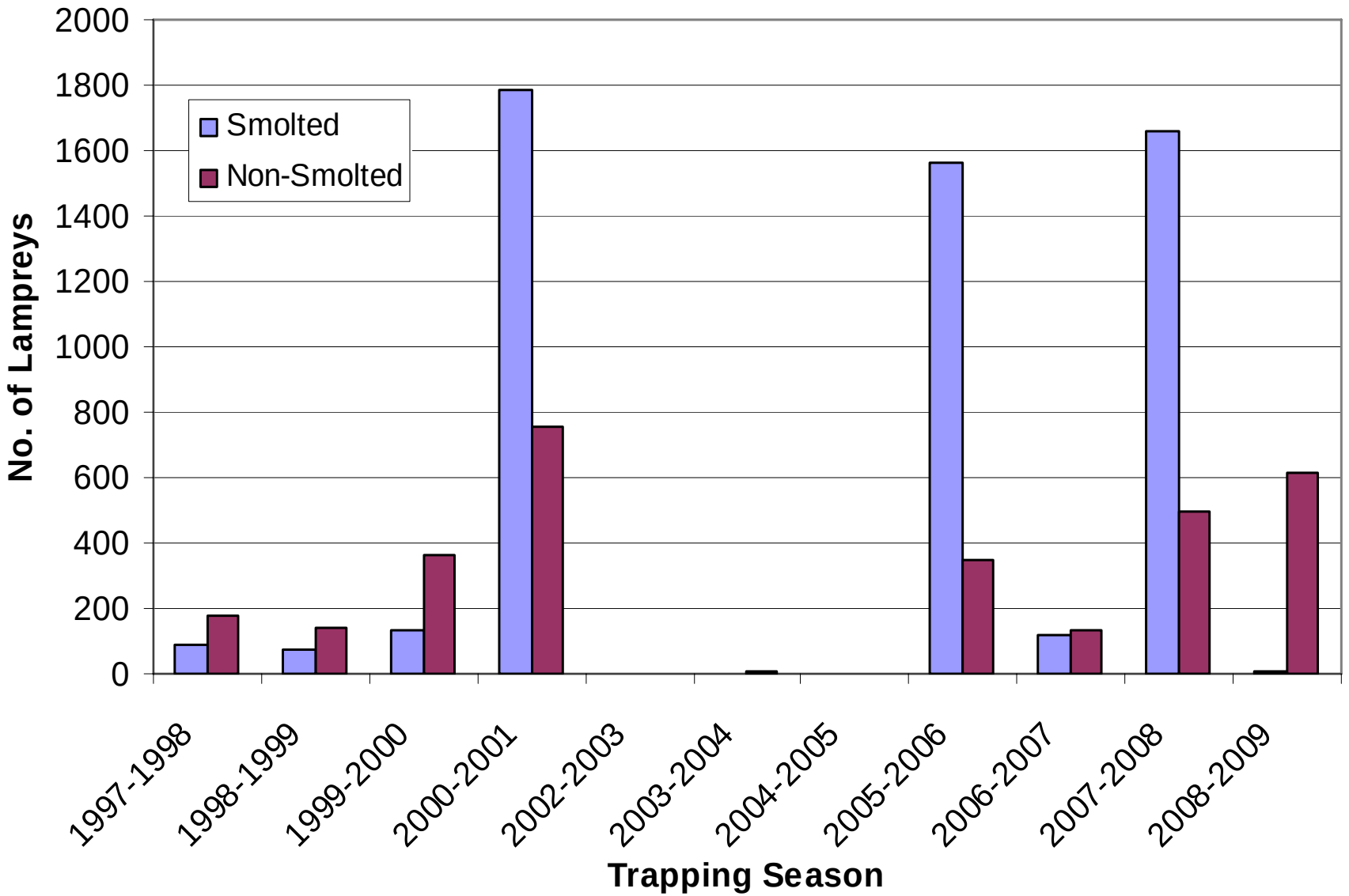
Can adult translocation increase levels of out-migrant metamorphosed lampreys?

Method

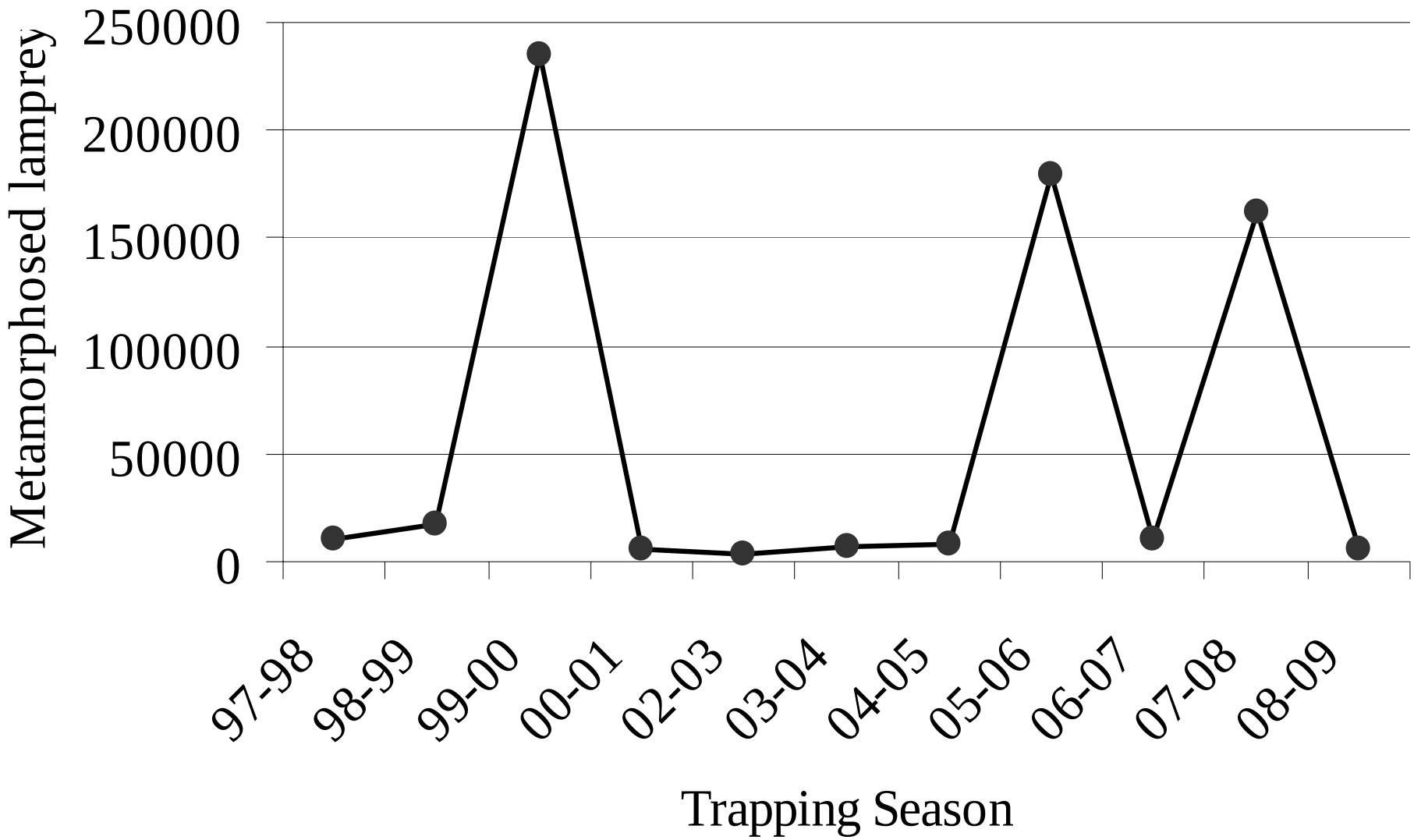
- **Rotary-Screw Trap 1998-2009**



Juvenile Lamprey Sampled



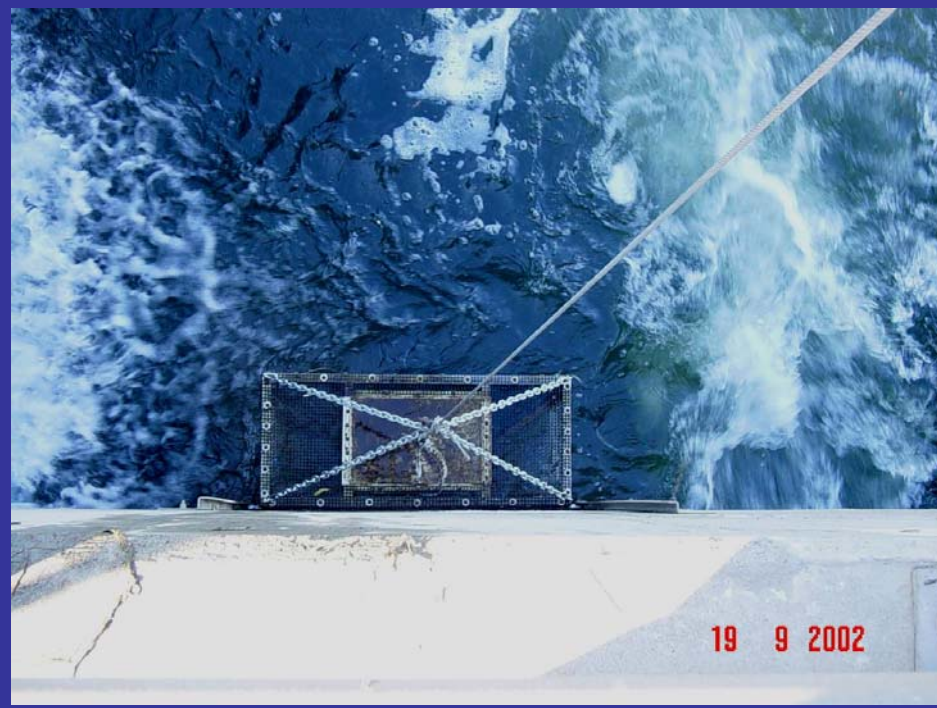
Out-migrant lamprey



Are adult lampreys entering the Umatilla River?

Method

- Portable assessment traps 1999-June 2009
- Fished at Three Mile Falls Dam

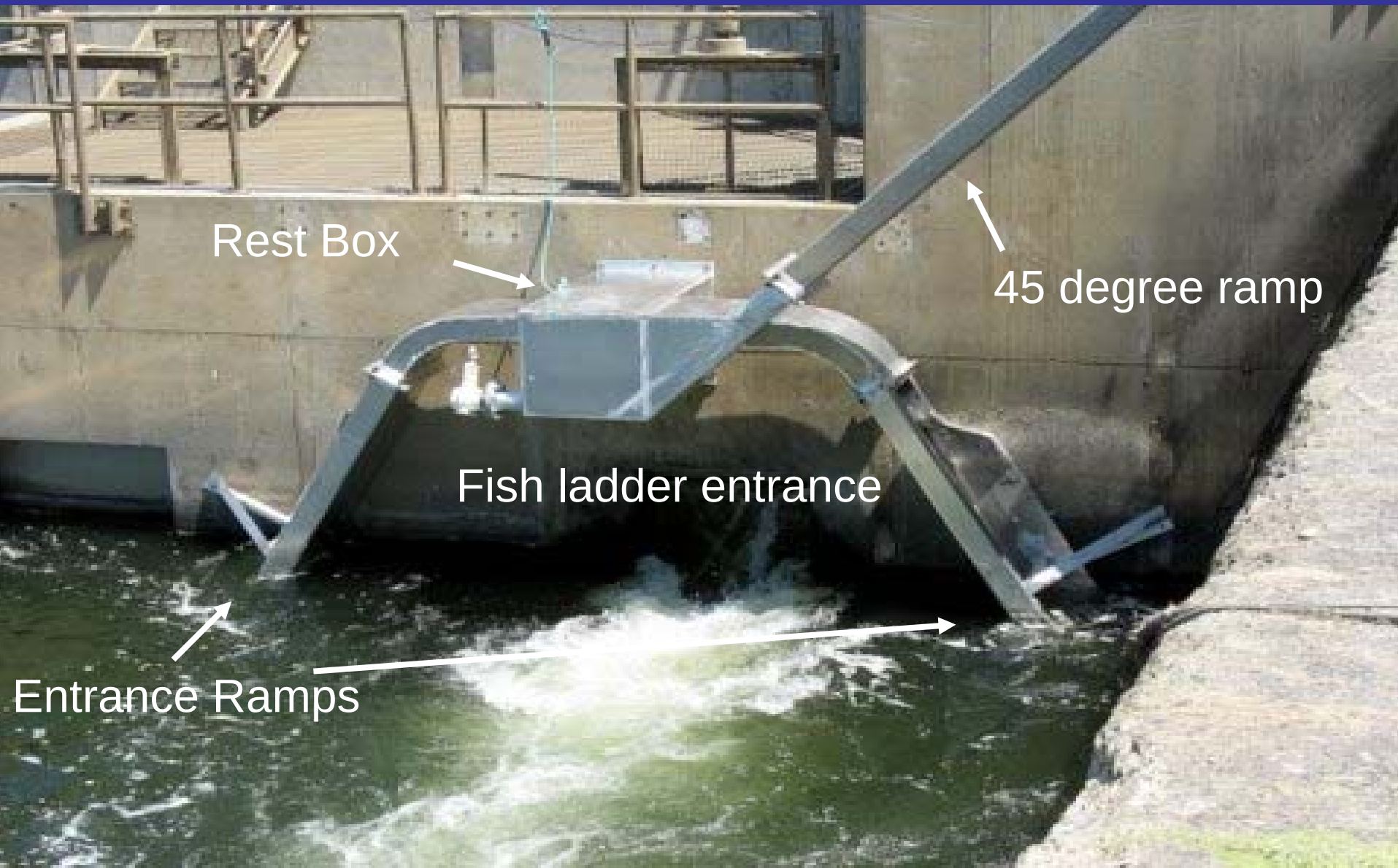


Method

- Three Mile Falls Dam Lamprey Passage Structure, July 2009
- Operational April-October
- 4 adult lamprey have passed to date

Three Mile Falls Dam Lamprey Passage Structure

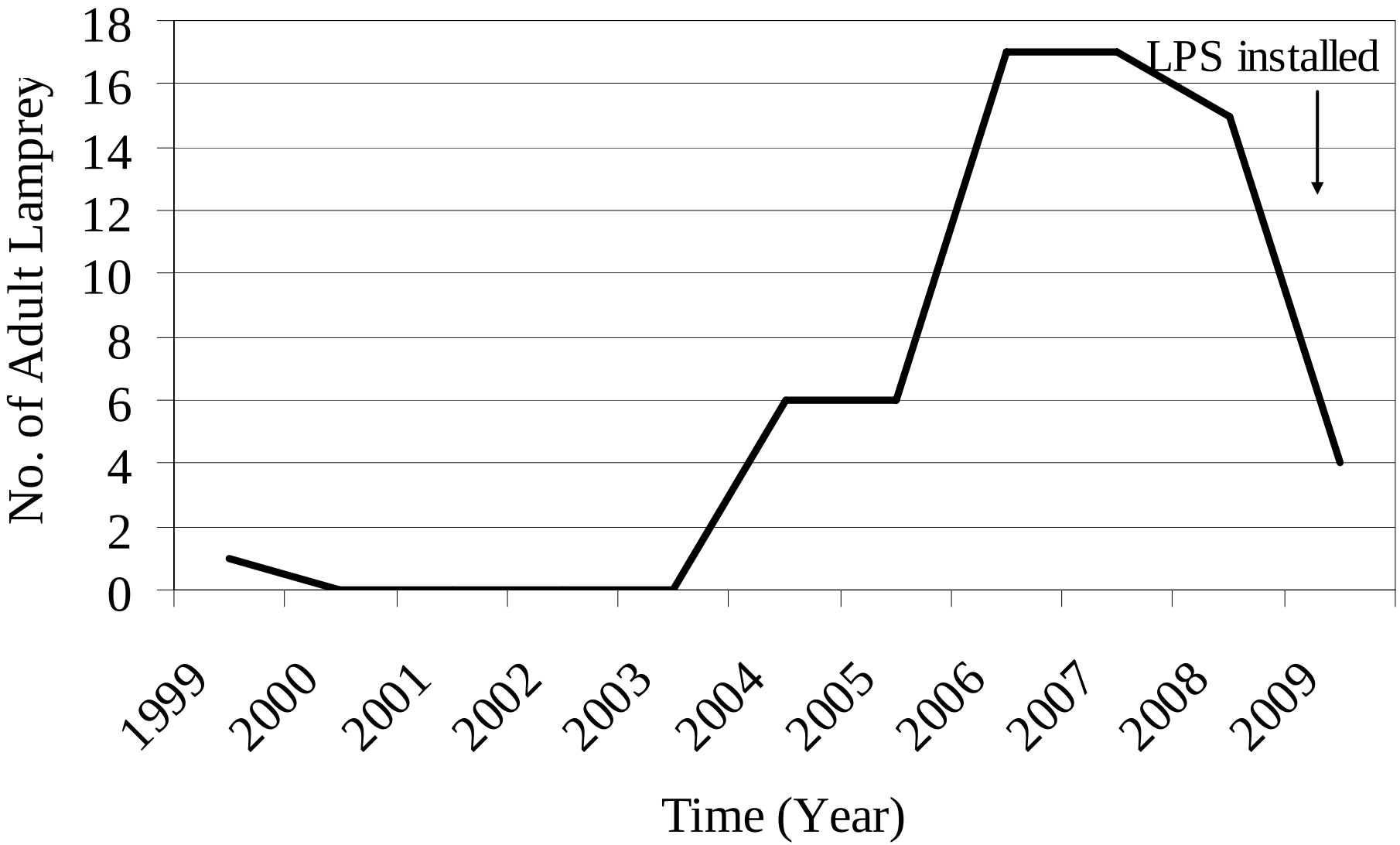
Lamprey Passage Structure
Overview of Entrance



Lamprey Passage Structure

Overview of Exit

Adult lamprey abundance



Summary

- Adult lampreys can be held until sexually mature
- Translocated lampreys successfully built nests
- Egg viability was relatively high
- Distribution of larvae increased in headwater areas and moved downstream through time

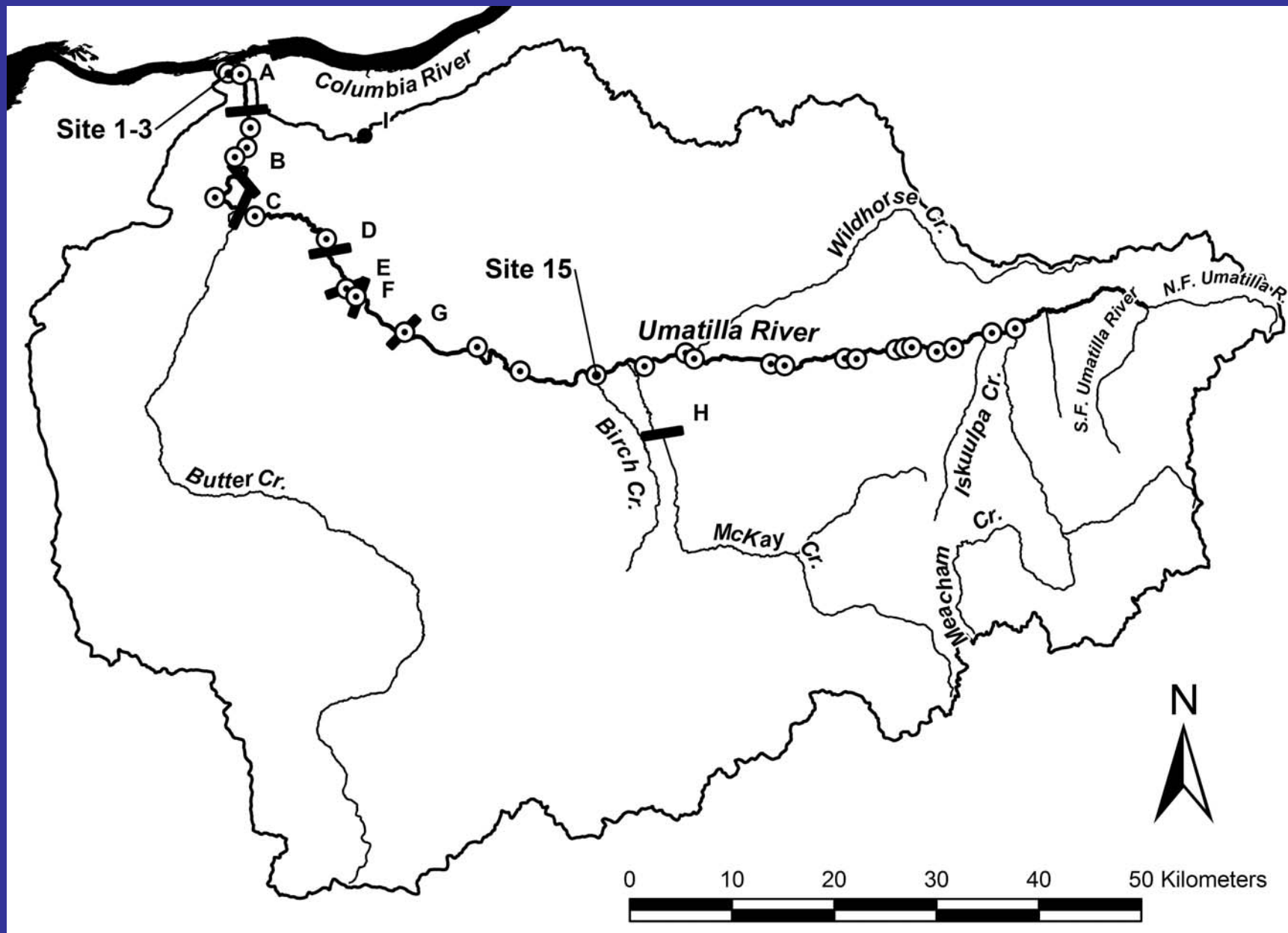
Summary continued

- Larvae grew fast
- Larval density increased through time
- Likely increase in metamorphosed lamprey levels
- Large portion of larvae metamorphose in main-stem Columbia River
- Adult lampreys numbers slightly increased
- Adults have used the new lamprey passage structure

Possible Bottlenecks

- **Larvae & metamorphosed stage**
- **Adult lamprey spawning migration**

Irrigation dams - Umatilla R.

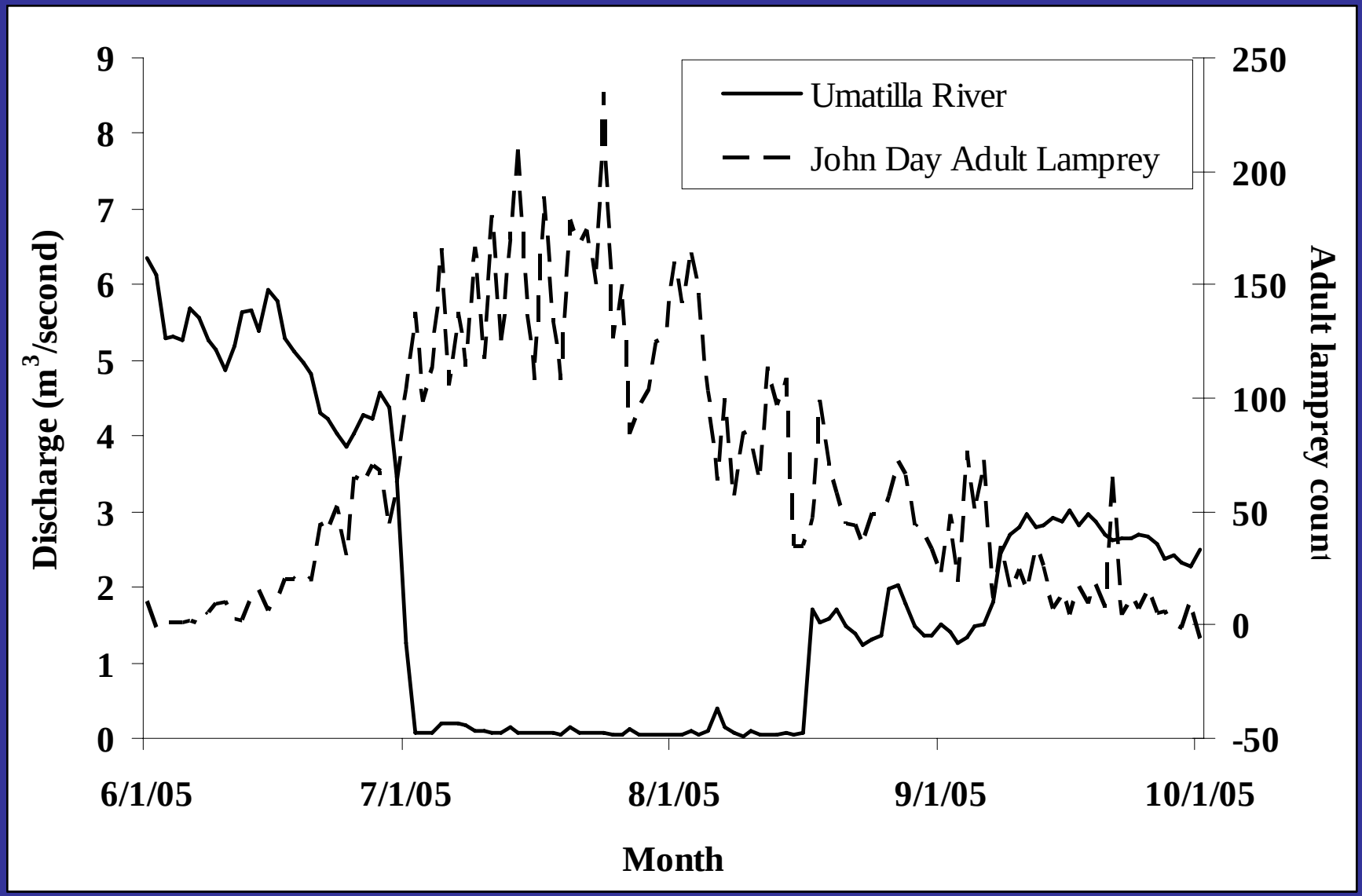


Fish screens - canals

Possible Bottlenecks

- Larvae & metamorphosed stage
- Adult lamprey spawning migration

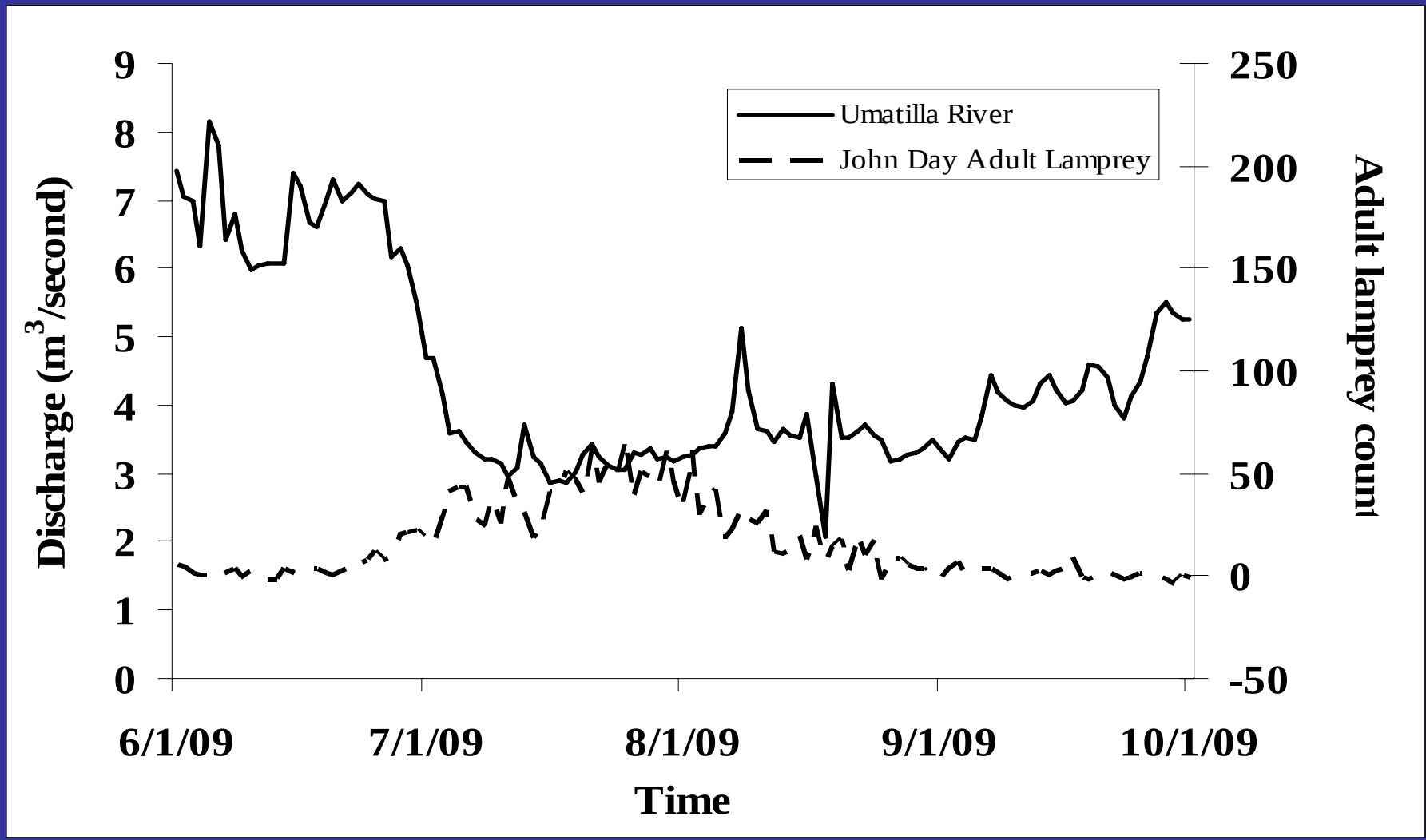
Pre-Flow Enhancement
Lower Umatilla River



Passage Improvements

- BPA Flow enhancement in lower Umatilla River during adult migration period (July 1-Aug 15)
- Installation of Lamprey Passage Structure at Three Mile Falls Dam (June 2009) other diversion lamprey passage structures in 2010+

Post-Flow Enhancement
Lower Umatilla River



What does the future hold??

Funding

- Funding provided for this project was provided by Bonneville Power Administration — critical to continue translocation
- Based on Columbia run status, funding commitments will be critical to address adult and juvenile passage issues
- Acknowledgements