Early Development of Artificial Propagation Methods for Pacific Lamprey

Mary L. Moser, Alexa N. Maine, Aaron D. Jackson, and Ralph Lampman
Collaboration is Key!
Brood Collection and Sexual Maturation

Fertilization and Incubation

Disinfection and Transport Pitfalls and Successes

Additional Studies
Brood Collection and Sexual Maturation
Adults Collected at Mainstem Dams
Held Overwinter
Genetic and Disease Sampling
Sorted Broodstock:

April 17
May 11
June 1
Temperature at Minthorn Springs Holding Facility

Temperature (°C)

March 1 – June 1, 2017
9, 1100 L tanks
130 adults/tank
Minthorn Springs, 19L/min
3 reps of 3 treatments
Temp 5.9 -17.0 C

Dark (mean 0.0 lux)
Artificial Light mean 4.35 lux
Natural Light mean 588.7 lux
Fertilization and Incubation
Repeat Spawning of Both Sexes

Eggs Viable in Freshly Dead Females

Gamete Holding to 24 h and beyond

Short Gamete Contact Times

Eggs Sensitive to Physical Damage

Methods to Reduce Egg Adhesion

Egg Disinfection

1-2 min in 1% pineapple juice

Survival per Treatment-Embryos

Mean % Fertilized

Hold Time (h)

Survival at 24 hours 14 days 22 days

Formalin treatments (n=83.3)
Control groups (n=167.5)
Repeat Use of Individuals

Eggs Viable in Freshly Dead Females

Gamete Holding to 24 h and beyond

Short Gamete Contact Times

Eggs Sensitive to Physical Damage

Methods to Reduce Egg Adhesion

Egg Disinfection

CHAPTER TWENTY TWO

DEVELOPING TECHNIQUES FOR ARTIFICIAL PROPAGATION AND EARLY REARING OF PACIFIC LAMPREY (ENTOSPHENUS TRIDENTATUS) FOR SPECIES RECOVERY AND RESTORATION

RALPH LAMPMAN, MARY MOSER, AARON JACKSON, ROBERT ROSE, ANN GANNAM AND JAMES BARRON

Introduction

Of highest importance to the lower Columbia Basin Native American tribes is the focus on protection and enhancement of “First Foods” such as water, salmon (Onchorhynchus species), Pacific lamprey (Entosphenus tridentatus), deer (Odocoileus species), cous root (Sagittaria latifolia), and huckleberry (Vaccinium parvifolium). These foods are central to the perpetual cultural, economic and sovereign benefit of the tribes. Lamprey...
Effects of Flow

- **% Fertilized**
  - 5-May: 1
  - 11-May: 0.2
  - 12-May: 0.8
  - 18-May: 1
  - 25-May: 1

- **% Developed**
  - 5-May: 0.6
  - 11-May: 0.2
  - 12-May: 0.8
  - 18-May: 1
  - 25-May: 1

*flow: filled bar, no flow: empty bar*
First Feeding Larvae
Additional Studies With Early Larvae:

Temperature and Salinity Tolerance of Prolarvae (very tolerant)

Substrate Requirements of Early Larvae (need substrate)

Effects of Food Particle Size on First-Feeding Larvae (smaller is better)

Density Effects on Growth and Survival (resilient to very high densities, but with growth consequences)
Thanks to:
Emma Stevens, Rondi Nordal, Chris Dailey, Justin Pearson and Walla Walla Community College staff
Nat Scholz, Mark Tagal, and Mukilteo Research Station staff
Jerrid Weaskus, Kanim Moses (CTUIR)
Tyler Beals, Davey Lumley, Patrick Luke (Yakama Nation),
Sue Camp (BOR), Debbie Docherty (BPA) and Steve Hemstrom (Chelan PUD)