

Attachment 3

Presentation by Mary Moser on Early Development of Artificial Propagation Methods for Pacific Lamprey

Early Development of Artificial Propagation Methods for Pacific Lamprey



Mary L. Moser, Alexa N. Maine,
Aaron D. Jackson, and Ralph Lampman





Brood Collection and Sexual Maturation

Fertilization and Incubation

Effects of Particle Size on First Feeding

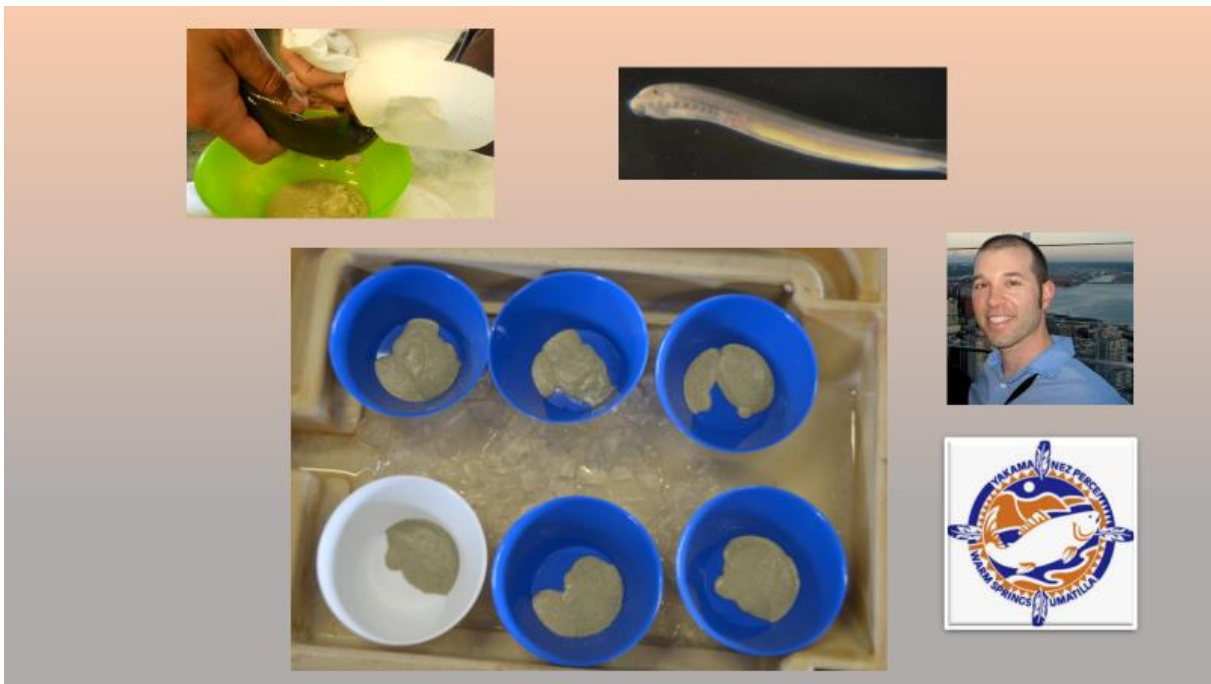
Tolerance of Environmental Factors

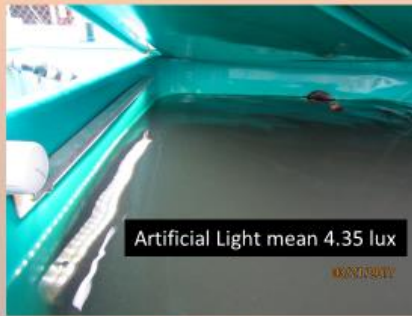
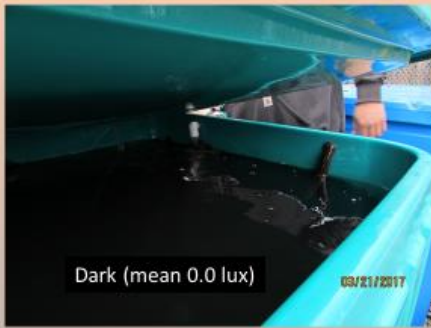
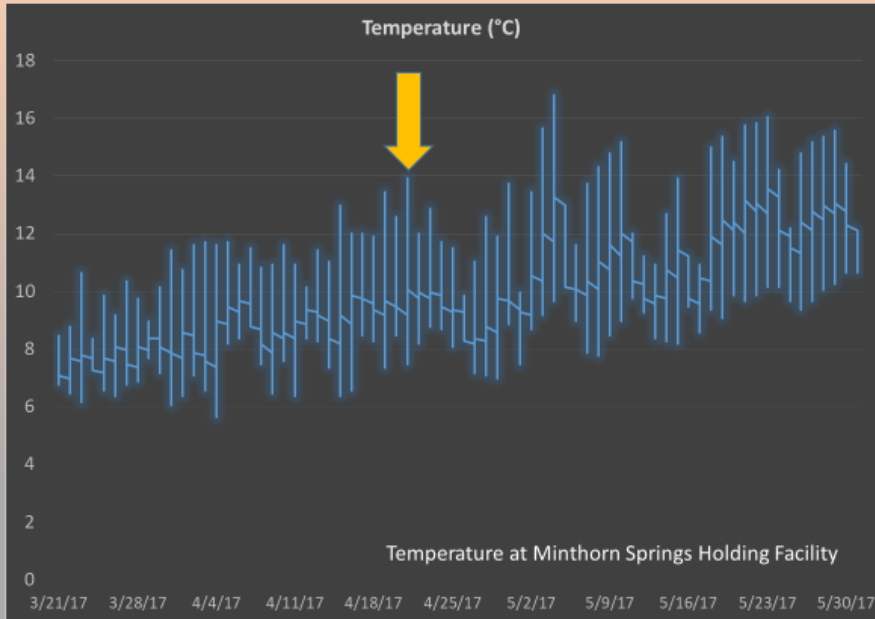
Brood Collection and Sexual Maturation



Adults Collected at Columbia River Dams
Held Overwinter
Genetic and Disease Sampling







March 1 – June 1, 2017

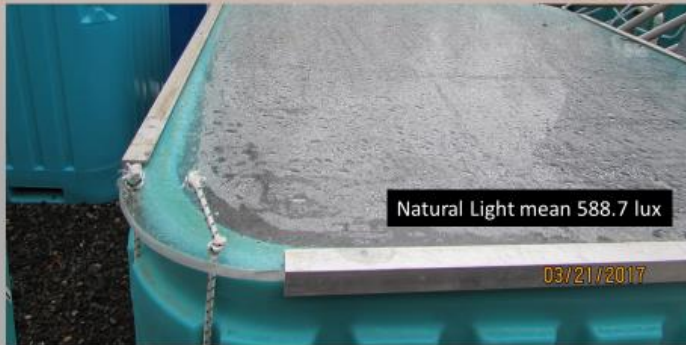
9, 1100 L tanks

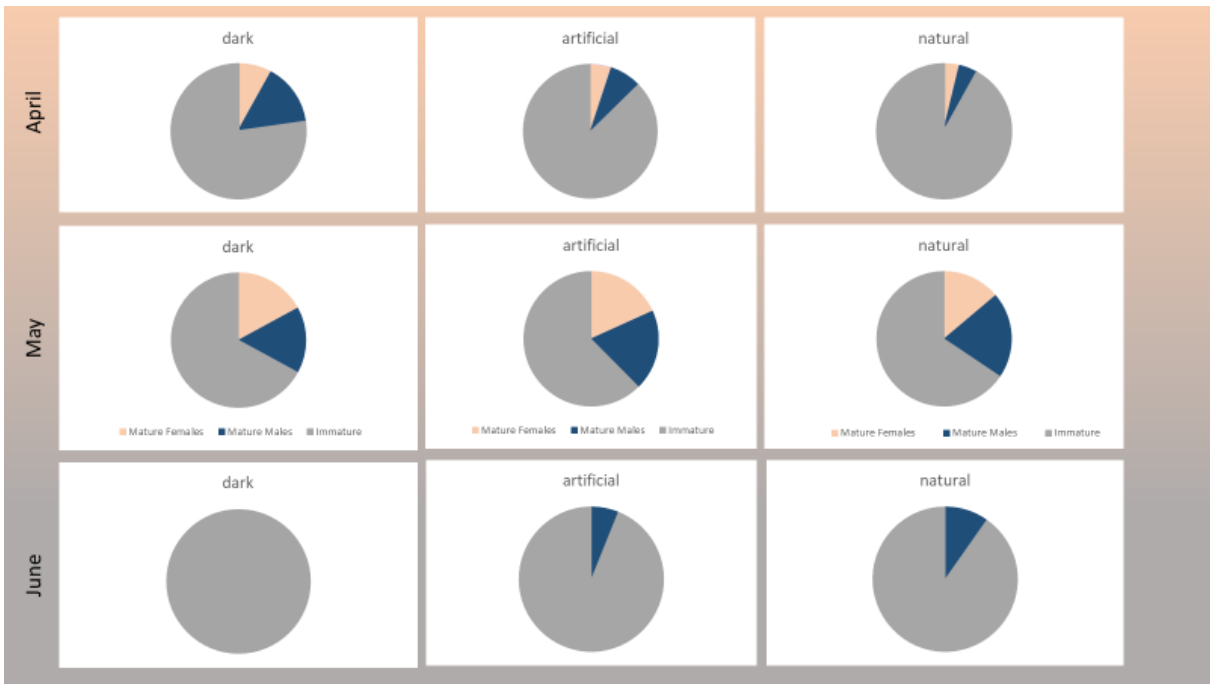
130 adults/tank

Minthorn Springs, 19L/min

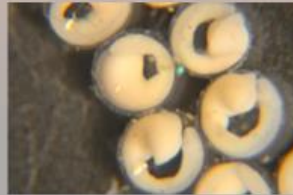
3 reps of 3 treatments

Temp 5.9 -17.0 C





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

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 (*ENTOSPHEMUS TRIDENTATUS*) FOR SPECIES RECOVERY AND RESTORATION

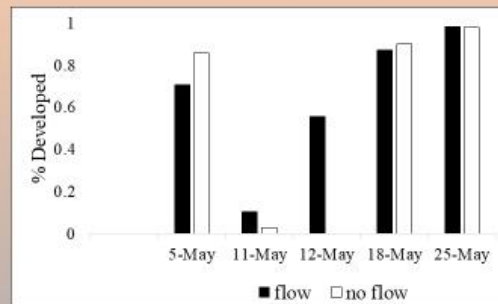
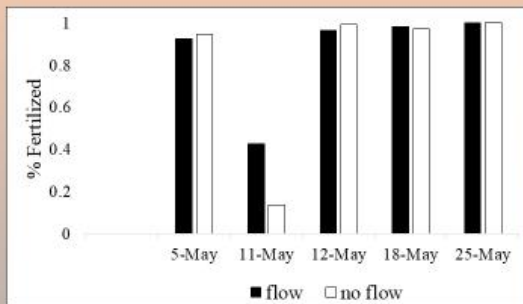
RALPH LAMPMAN, MARY MOSER,
AARON JACKSON, ROBERT ROSE,
ANN GANNAM AND JAMES BARRON

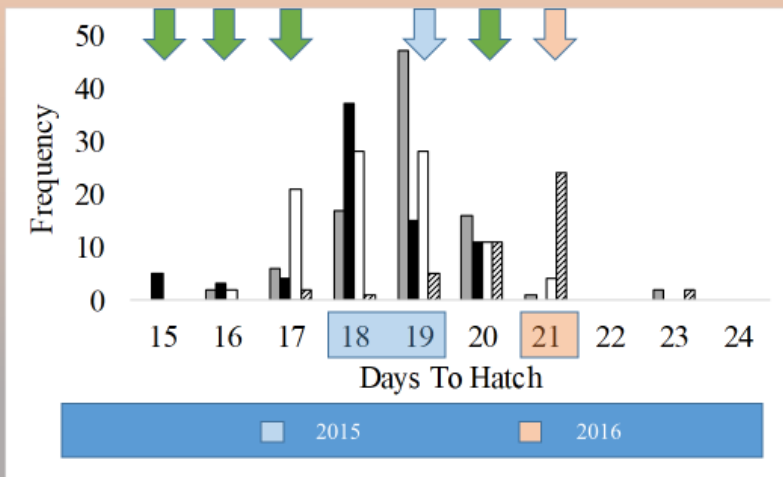
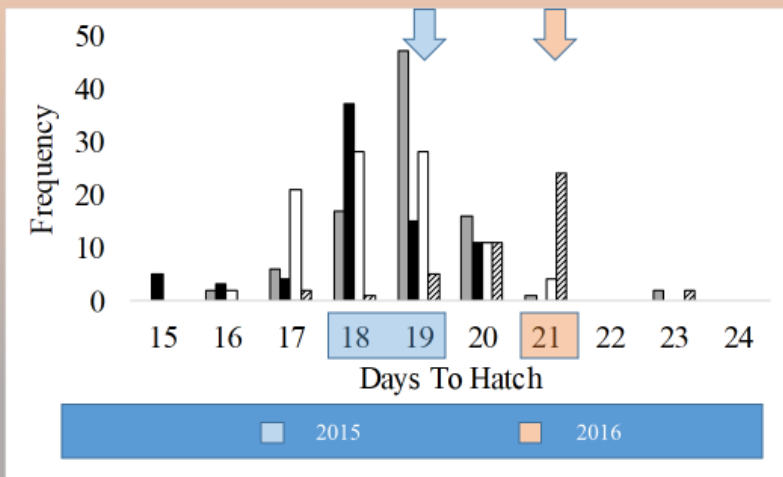
Introduction

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 (*Oncorhynchus* species), Pacific lamprey (*Entosphenus tridentatus*), deer (*Odocoileus* species), cou root (*Sagittaria latifolia*), and huckleberry (*Vaccinium parvifolium*). These foods are central to the perpetual cultural, economic and sovereign benefit of the tribes. Lamprey

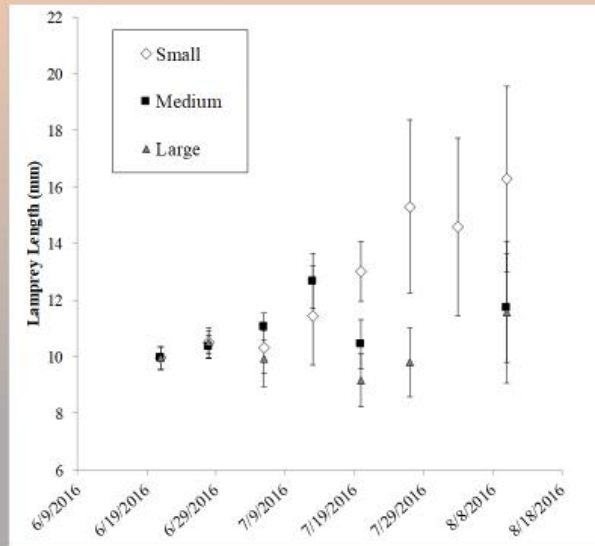
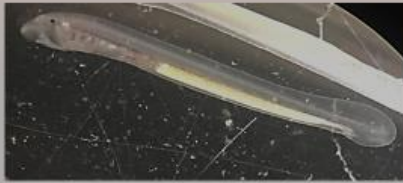
Lampman, R., M. L. Moser, A. D. Jackson, R. K. Rose, A. L. Gannam, and J. M. Barron. 2016. Developing techniques for artificial propagation and early rearing of Pacific Lamprey (*Entosphenus tridentatus*) for species recovery and restoration. In A.M., Orlov and R. J. Beamish, editors: Jawless Fishes of the World. 2 volumes. Cambridge Scholars Publishing, Cambridge, UK.

Effects of Flow





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



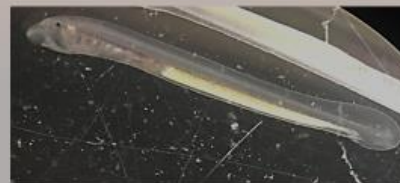
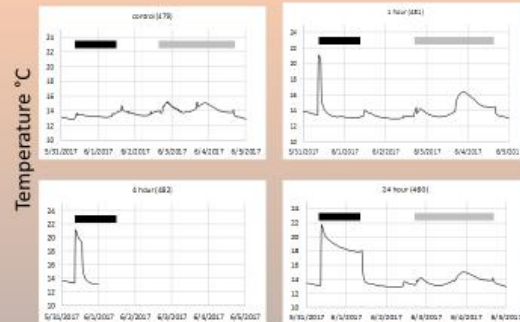
Temperature and Salinity Tolerance

Prolarvae

Survived thermal challenges of 8°C for 24h
Survived for 24 h at 10 ppt and 14 ppt
Survived for 2 wk at 3.5 ppt

Parasites

Died after 2 min in 14 ppt
Died within 30 min at > 7 ppt





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