Using lamprey biology to inform habitat restoration at watershed & continental scales

Benjamin Clemens
10 species in Pacific Northwest
Anadromous / Parasitic

Pacific Lamprey (> 13”)
Western River Lamprey (≤12”)

Resident / Non-feeding

Western Brook lampreys (≤ 7”)

Sensitive
1. Species
2. Distribution
3. Life cycles
4. Population structure (*Don’t home*)
5. Habitat use
6. Restoration (*Many scales*)
Pacific Lamprey
Entosphenus tridentatus

- Historical distribution based on observation
- Current distribution based on observation (1,256 observations)

Oregon Fish Habitat Distribution Database
Oregon Department of Fish and Wildlife, 2018
Distribution: North Pacific
1. Species
2. Distribution
3. Life cycles
4. Population structure \textit{(Don’t home)}
5. Habitat use
6. Restoration \textit{(Many scales)}
Anadromous
Pacific Lamprey
W. River Lamprey
1 - 4 yrs

Resident
Brook lamprey

Jeremy Five Crows
Michael Durham
1. Species
2. Distribution
3. Life cycles
4. Population structure (*Don’t home*)
5. Habitat use
6. Restoration (*Many scales*)
Bergstedt & Seelye 1995; Spice et al. 2012
Migratory pheromones

Fine et al. 2004; Yun et al. 2011
Mating pheromones

Yun et al. 2014
Population structure

- Pacific Lamprey
  - Don’t home
  - Little genetic richness

- Other lampreys
  - Home?
  - Genetic richness
  - Species complex

1. Species
2. Distribution
3. Life cycles
4. Population structure (*Don’t home*)
5. Habitat use
6. Restoration (*Many scales*)
Pacific Lamprey

Western Brook Lamprey

Western River Lamprey
Marys River, Willamette Basin
Pringle Creek, Willamette Basin

Pete Baki
Beaver Creek, OR Coast
Habitat use: adult Pacific Lamprey

Willamette Falls, OR
Channelization of Willamette

Historical Channel Reconstruction by Gregory, Ashkenas, and Minear
Oregon State University Department of Fisheries and Wildlife

Gregory et al. 2002
Channelization of Willamette

1850  1895  1932  1995

Corvallis

Albany

Harrisburg

1:300000

Historical Channel Reconstruction by
Gregory, Ashkenas, and Minear
Oregon State University
Department of
Fisheries and Wildlife

Gregory et al. 2002
Total lamprey harvest (Willamette Falls)

1932: ~ 500,000?

1995: ~ 29,000

# harvested

Year

Marys River, Willamette Basin
Catch per Unit Effort: Larvae
Catch per Unit Effort: Larvae

Schultz et al. 2014
1. Species
2. Distribution
3. Life cycles
4. Population structure (*Don’t home*)
5. Habitat use
6. Restoration (*Many scales*)
Homel, Lorion, Clemens in review

- Small streams: < 20 km²
- Medium streams: 20 – 80 km²
- Large rivers: > 80 km²
- Estuaries

OC Coho Salmon
1. Species
2. Distribution
3. Life cycles
4. Population structure
5. Habitat use
6. Restoration

Diverse
Don’t home
Many scales
Thank you

- Kris Homel
- Chris Lorion
- Richard Litts
- Mike Mader
- John Schafer
- Gary Vonderohe
- Pete Baki
- Steve Namitz
- Kelly Reis
- Mark Hereford
- Christina Wang
- Andrew Chione

- Deian Moore
- Jeremy Monroe
- Jason Dunham
- Matt Weeber
- Janine Castro
- Emmar Garner
- Trevan Cornwell
- Staci Stein
- Jeremy Five Crows
- Steve Starcevich
- Shaun Clements
- Stephanie Gunckel
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