

Pacific Lamprey: Life History, Species ID, Habitat, and Supplementation

Photo Credit: John Colby BLM

Ralph Lampman
Yakama Nation FRMP
Pacific Lamprey Project



The Lamprey Crew

Tyler Beals



Sean Goudy



Dave'y Lumley



Frank Spillar



Kaylei Ryan



April Hull



Yakama Nation Project Goal

To restore natural production to a level that will provide robust species abundance, significant ecological contributions, & meaningful harvest throughout the Yakama Nations Ceded Lands & in the Usual & Accustomed areas.

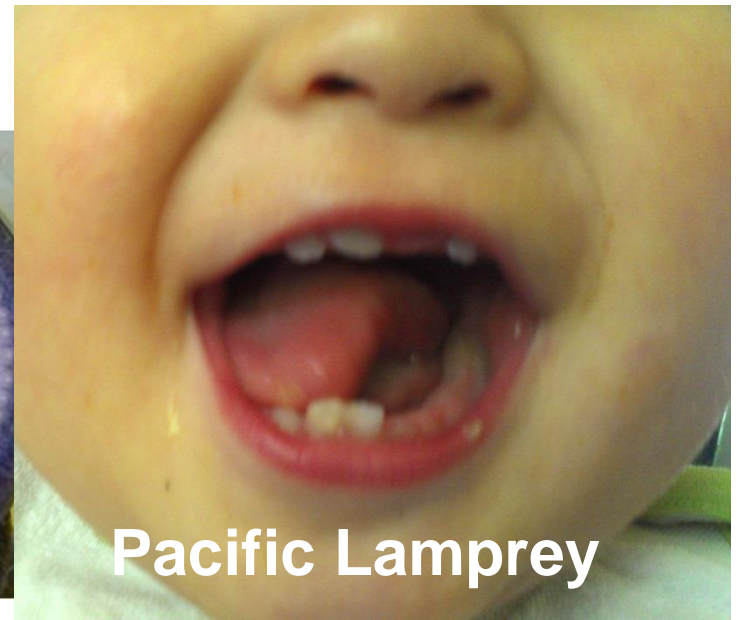
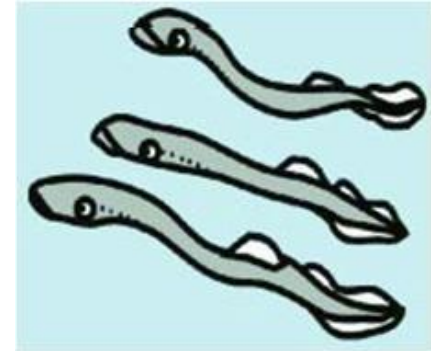
Long Term Goal:
35,000

2015:
22

1913

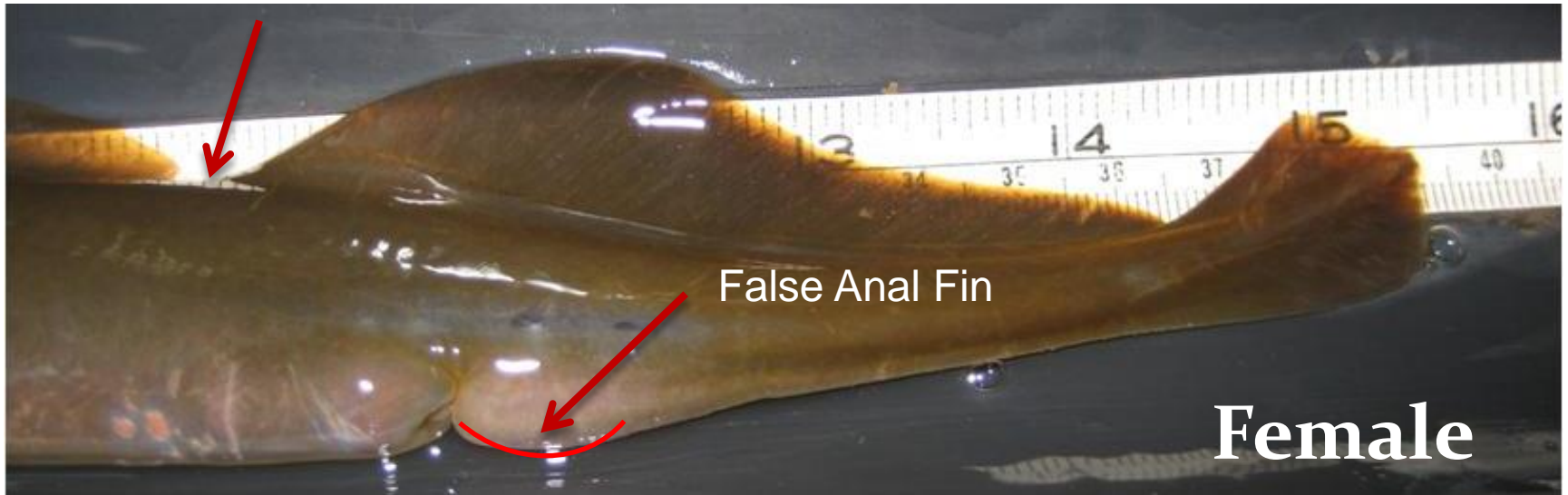
et al. at Willamette Falls. 7/15

Life History & Species ID



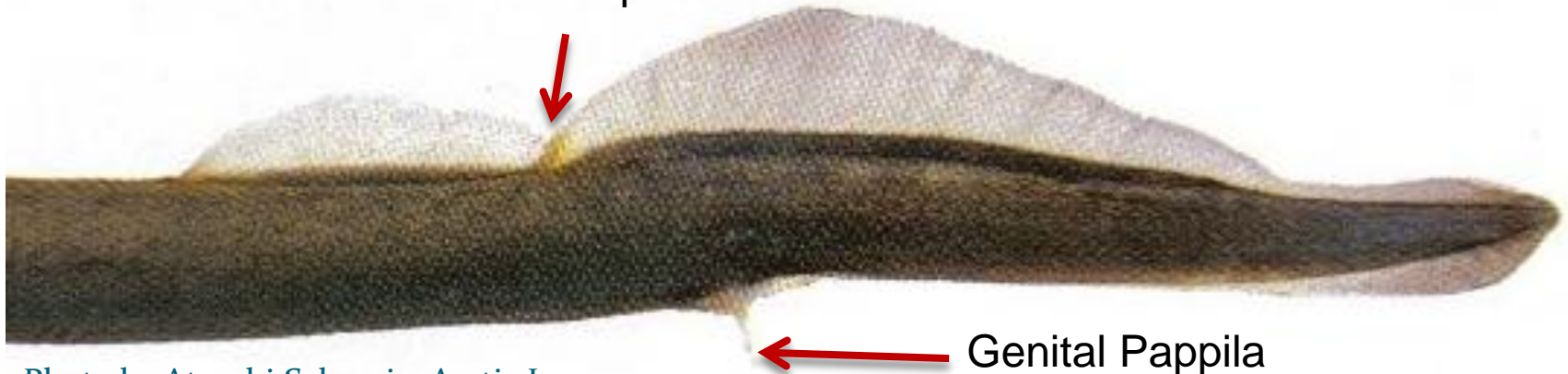
Maturity & Female vs. Male

Dorsal Gap Closed



Male

Dorsal Gap Closed



Adult Lamprey Identification

Pacific Lamprey

330-800 mm

A = Female, B = Male



Ocean
Maturing



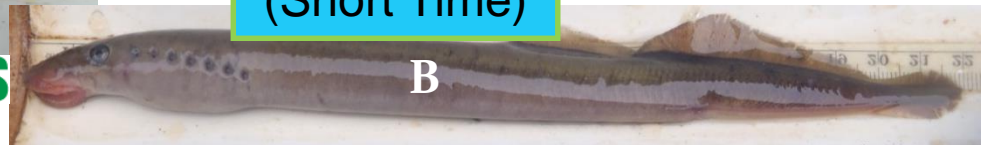
Western River Lamprey

200-300 mm

Ocean
Maturing
(Short Time)



USGS



USGS

Western Brook Lamprey

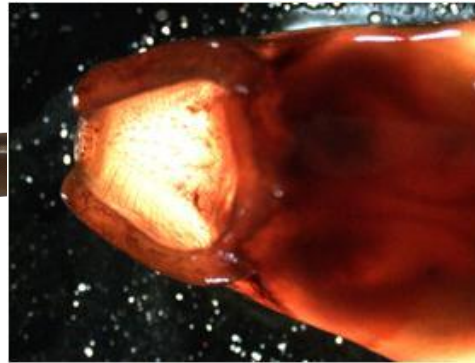
90-180 mm

Resident



Pacific Lamprey (*Entosphenus tridentatus*)

10 – 200 mm



Ammocoete

(larva)

Freshwater

100 – 190 mm



Macrophthalmia

(lamprey smolt)

Heading to Ocean

330 – 800 mm






Adult

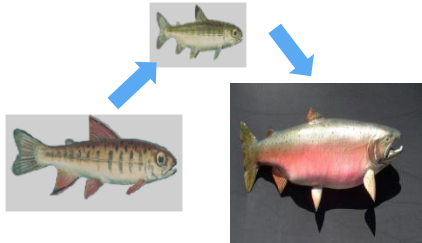
(spawning)

Return to Freshwater

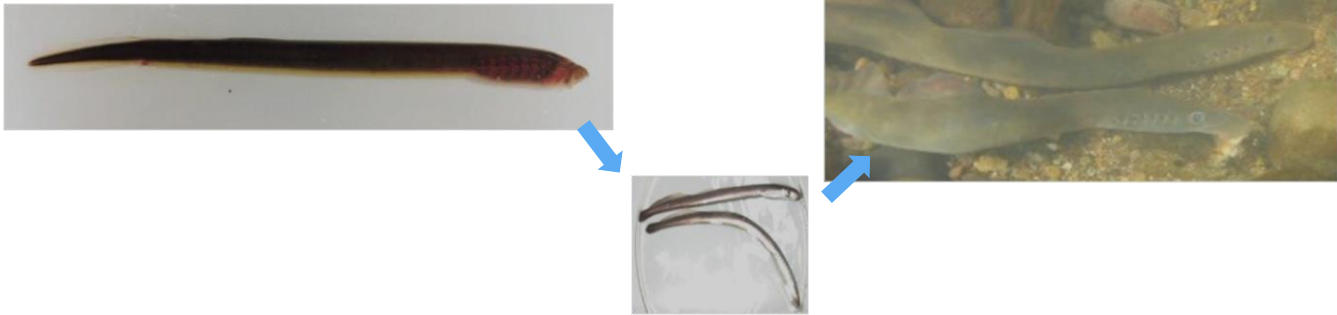
Life History Timeline

-  = Freshwater
-  = Transition
-  = Ocean

Coho Salmon



Pacific
Lamprey



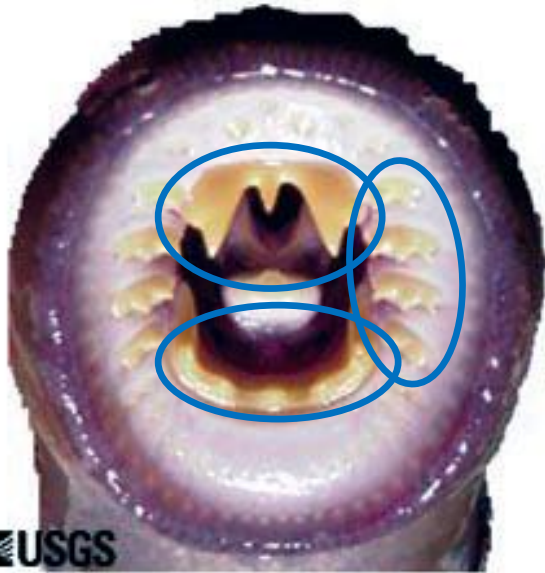
Western Brook
Lamprey



Year 1 2 3 4 5 6 7 8 9 10

Adult Lamprey Identification

Pacific Lamprey

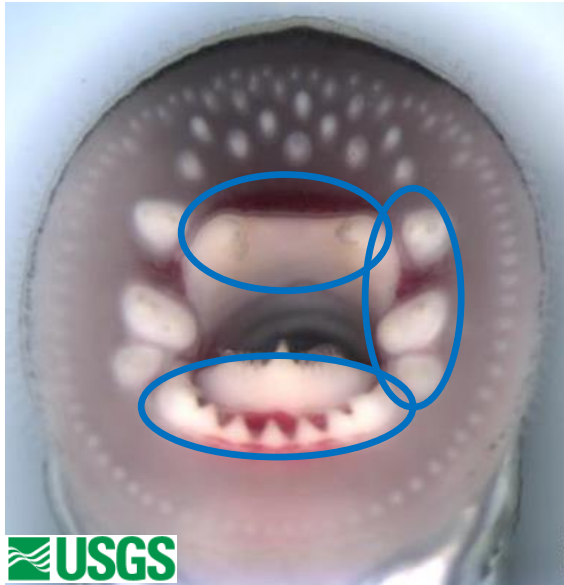


Supraoral Cusps: **3**

Endolateral Rows: **4**
(typically 2-3-3-2)

Infraoral Lamina: **5-6**

Western River Lamprey

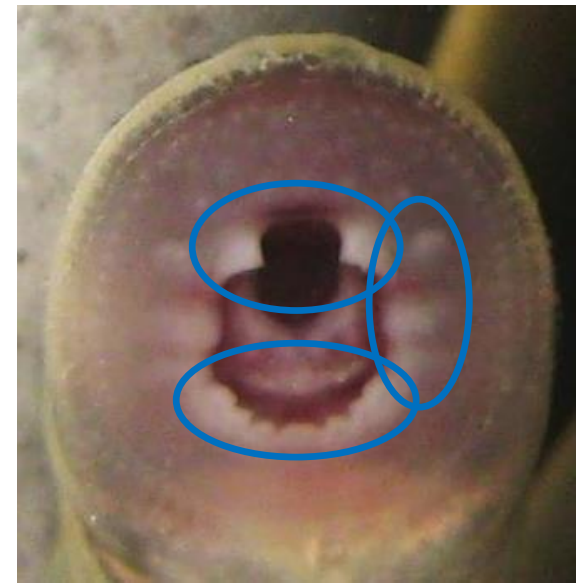


Supraoral Cusps: **2**

Endolateral Rows: **3**
(typically 2-3-2, 2-2-2)

Infraoral Lamina: **7-10**

Western Brook Lamprey



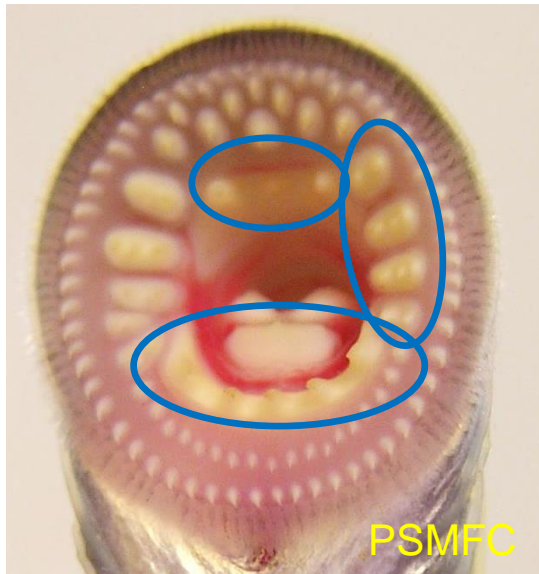
Supraoral Cusps: **2**

Endolateral Rows: **3**
(typically 1-2-1, 2-2-1,
or 2-2-2)

Infraoral Lamina: **7-10**

Transformer Lamprey Identification

Pacific Lamprey

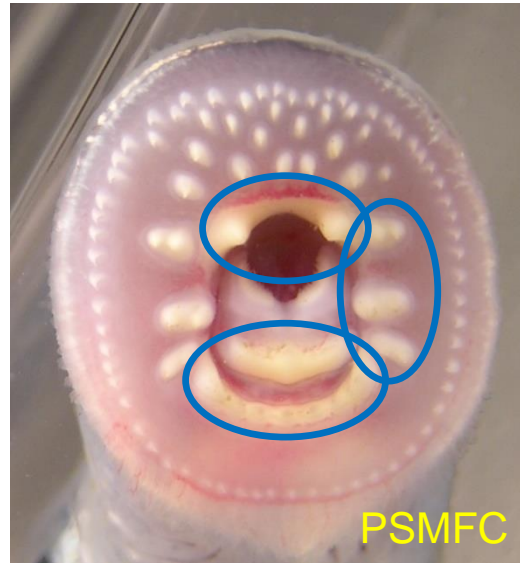


Supraoral Cusps: **2-3**

Endolateral Rows: **4**
(typically 2-3-3-2)

Infraoral Lamina: **5-6**

Western River Lamprey

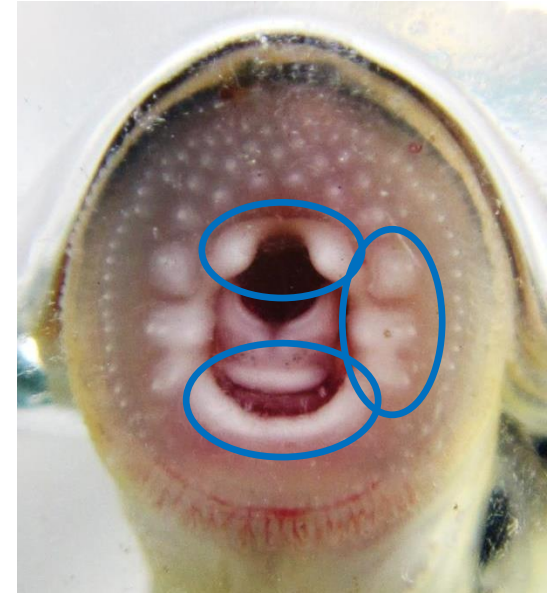


Supraoral Cusps: **2**

Endolateral Rows: **3**
(typically 2-3-2, 2-2-2)

Infraoral Lamina: **7-10**

Western Brook Lamprey



Supraoral Cusps: **2**

Endolateral Rows: **3**
(typically 1-2-1, 2-2-1,
or 2-2-2)

Infraoral Lamina: **7-10**

Transformer Lamprey Identification - Late

(Dec - June)

Pacific Lamprey

100-190 mm



Western River Lamprey

100-190 mm



Western Brook Lamprey

100-190 mm



Mouth = O

Tail = O

Color / Eyes & Disc Sizes = Δ



Transformer Lamprey Identification - Early

(Sep – Nov)

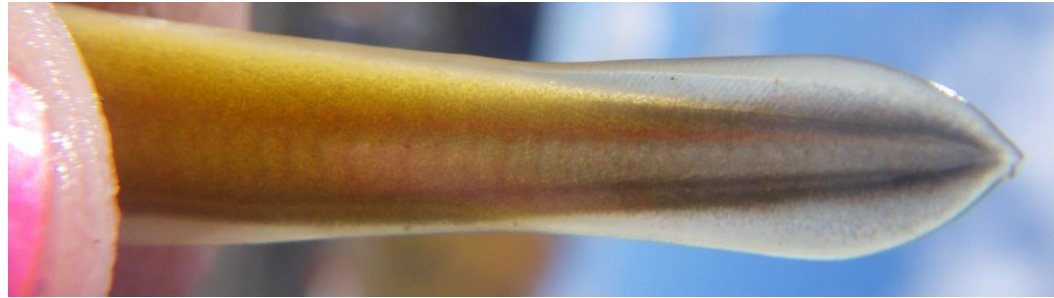
All Captured on 9/4/2014



Body Color, Eye & Mouth Sizes = X

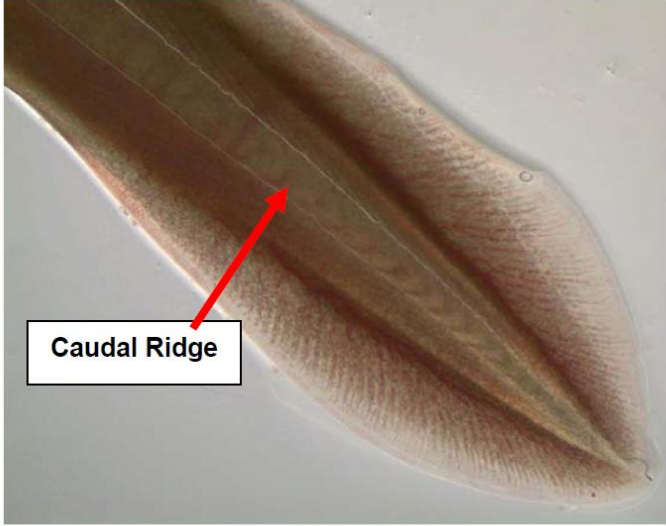
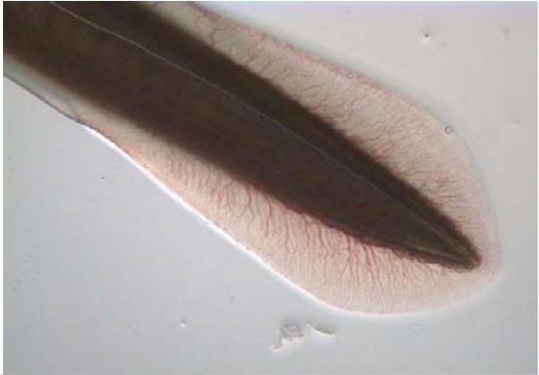

Tail = O

Larval Lamprey Identification



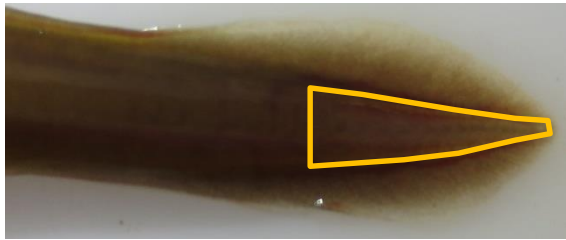
Ammocoete Identification Guide (Pacific, River, and Western Brook)

Note: Only useful for ammocoetes greater than 70mm

Pacific Lamprey		Western Brook and River Lamprey
		  <p style="text-align: right;">Photo: D. Goodman</p>
Caudal Ridge	Light pigmentation	Dark, even pigmentation
Caudal Fin	Darker pigmentation (hard to see)	Translucent or peppered pigmentation

Larval Lamprey Identification

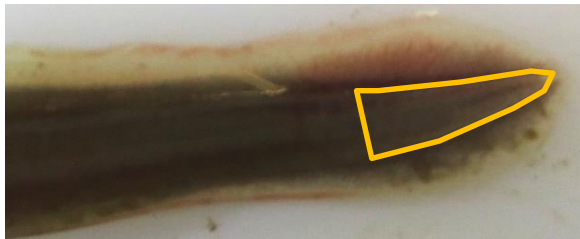
Pacific Lamprey



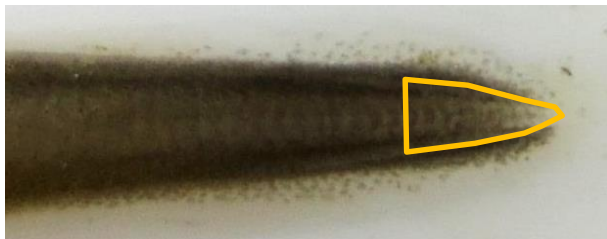
126 mm



103 mm



70 mm



48 mm

Western Brook (A)



>125 mm



100 mm



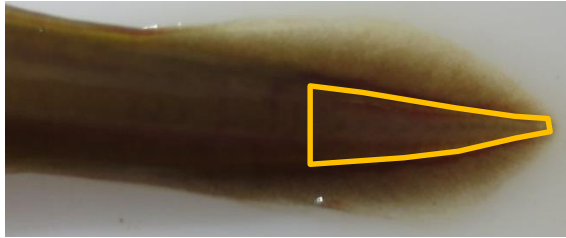
72 mm



47 mm

Larval Lamprey Identification

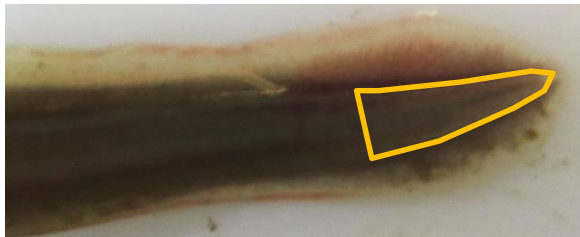
Pacific Lamprey



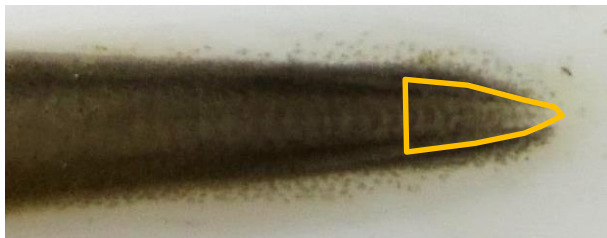
126 mm



103 mm

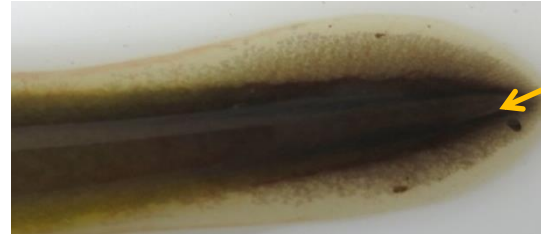


70 mm



48 mm

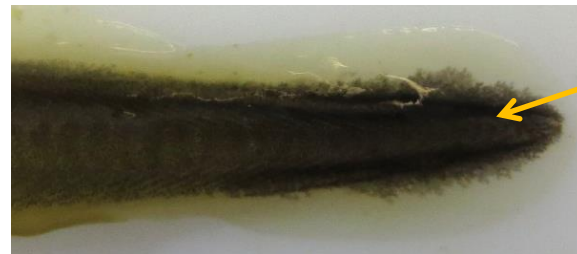
Western Brook / River Lamprey (B)



134 mm



107 mm

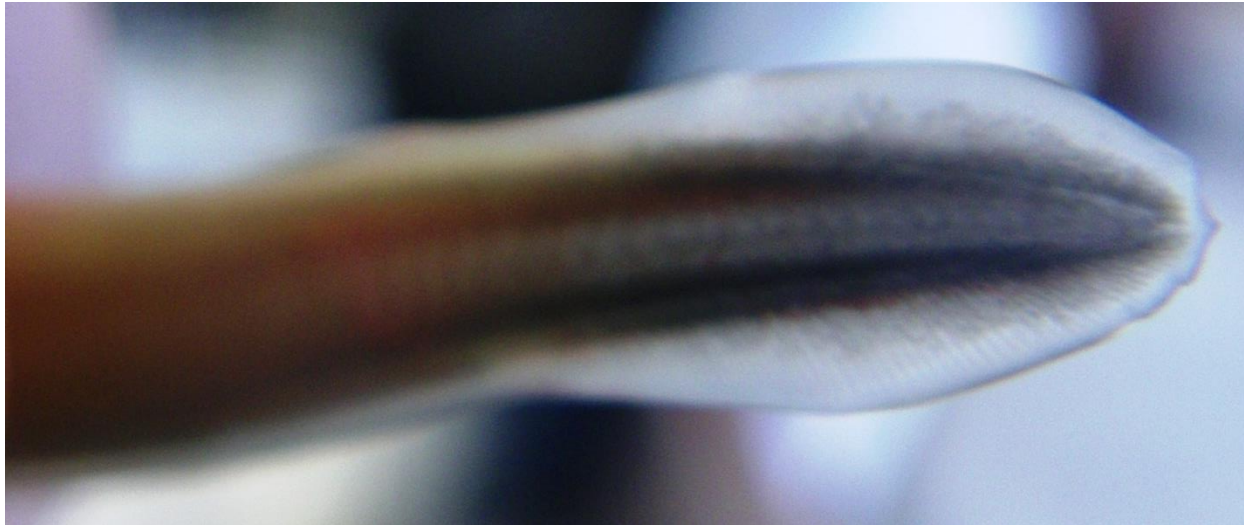


83 mm



57 mm

ID Test #1



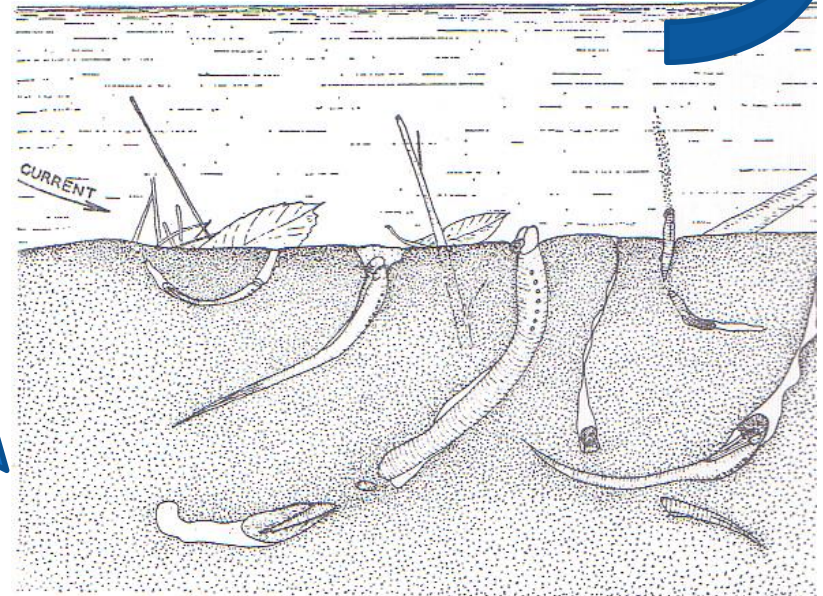
Western Brook / River Lamprey

ID Test #2

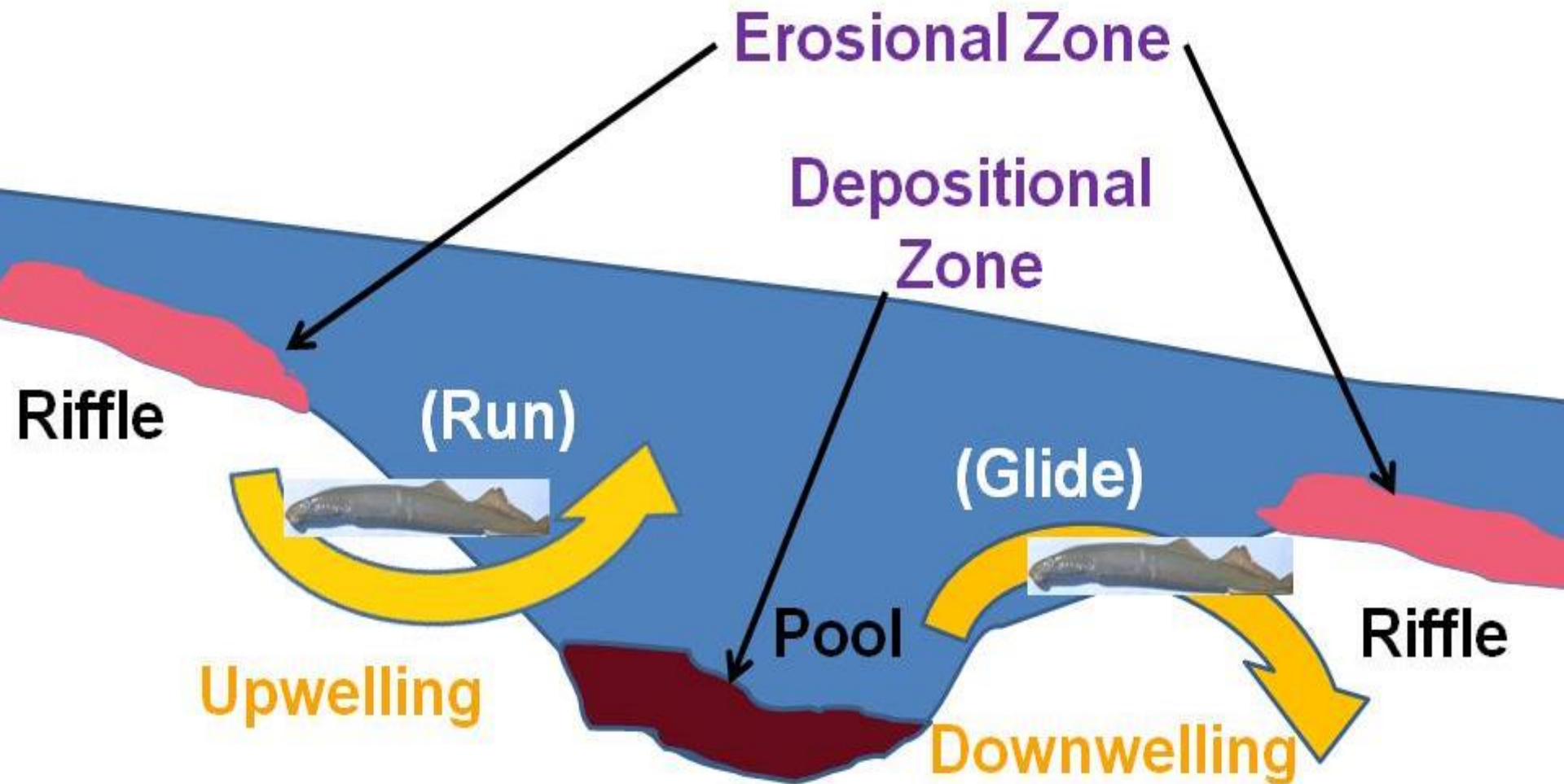


Leech 😊

Habitat Requirements



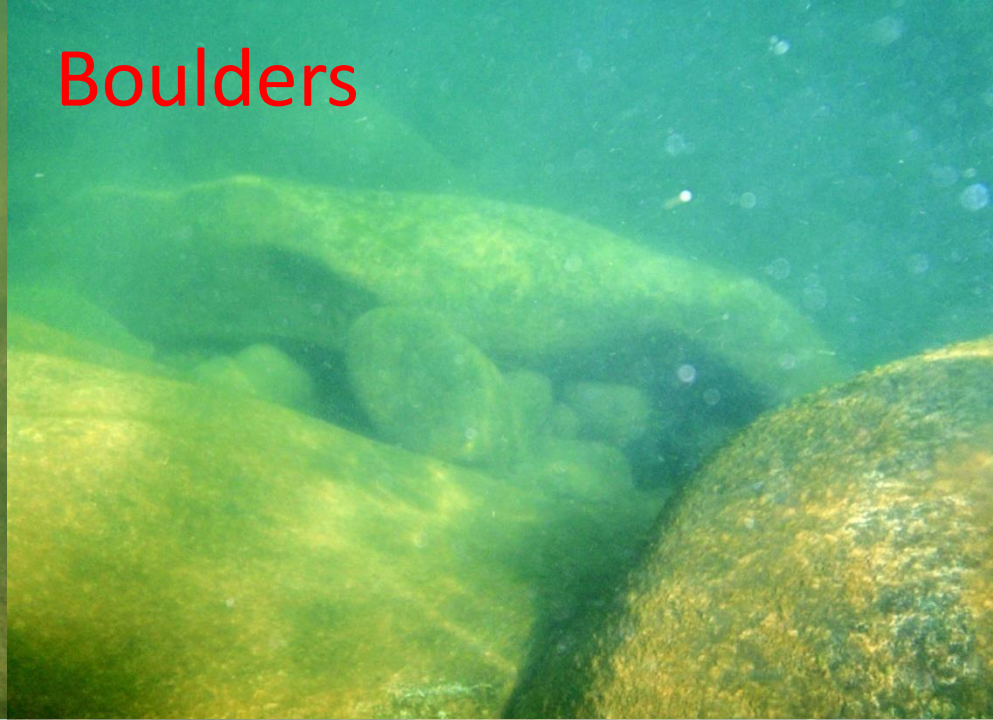
Habitat - Adult Overwintering (Conceptual Model)



Bedrock Crevices



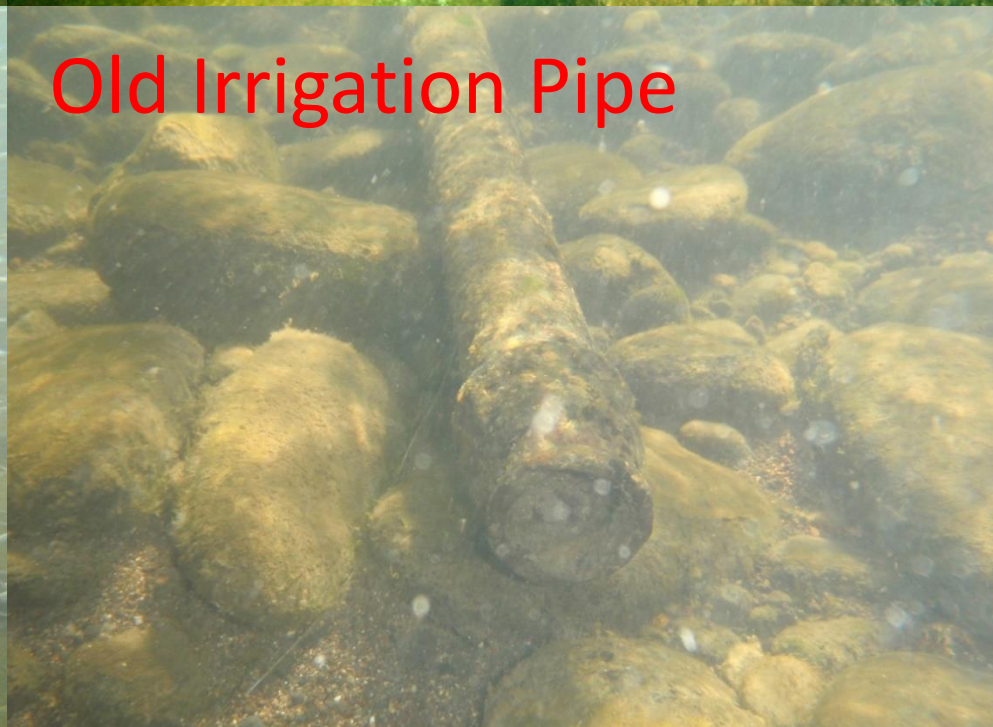
Boulders



Turbulence



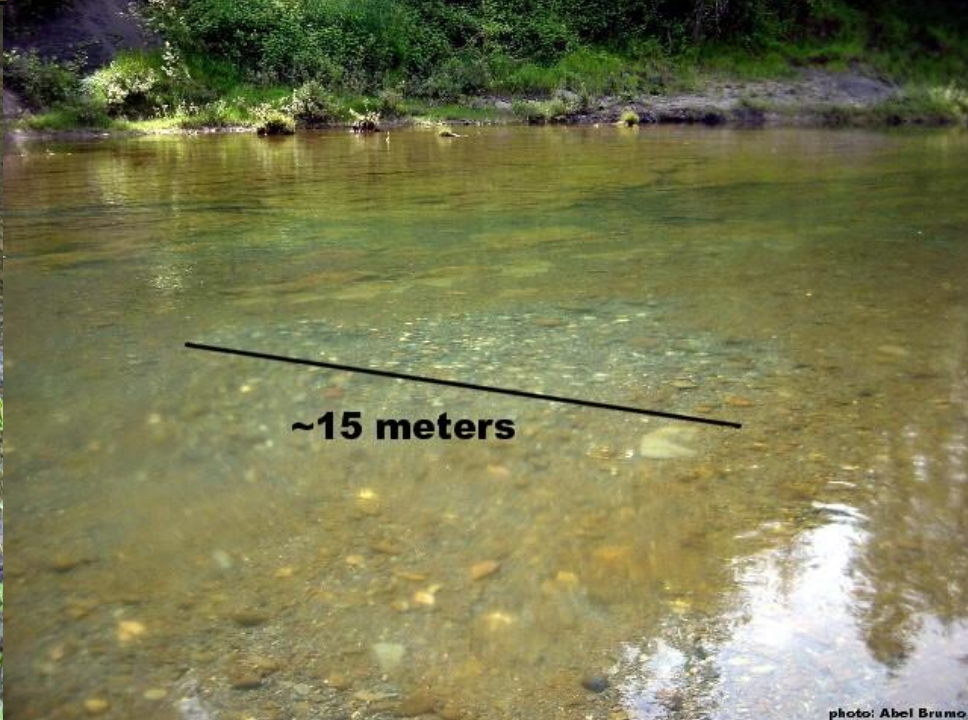
Old Irrigation Pipe





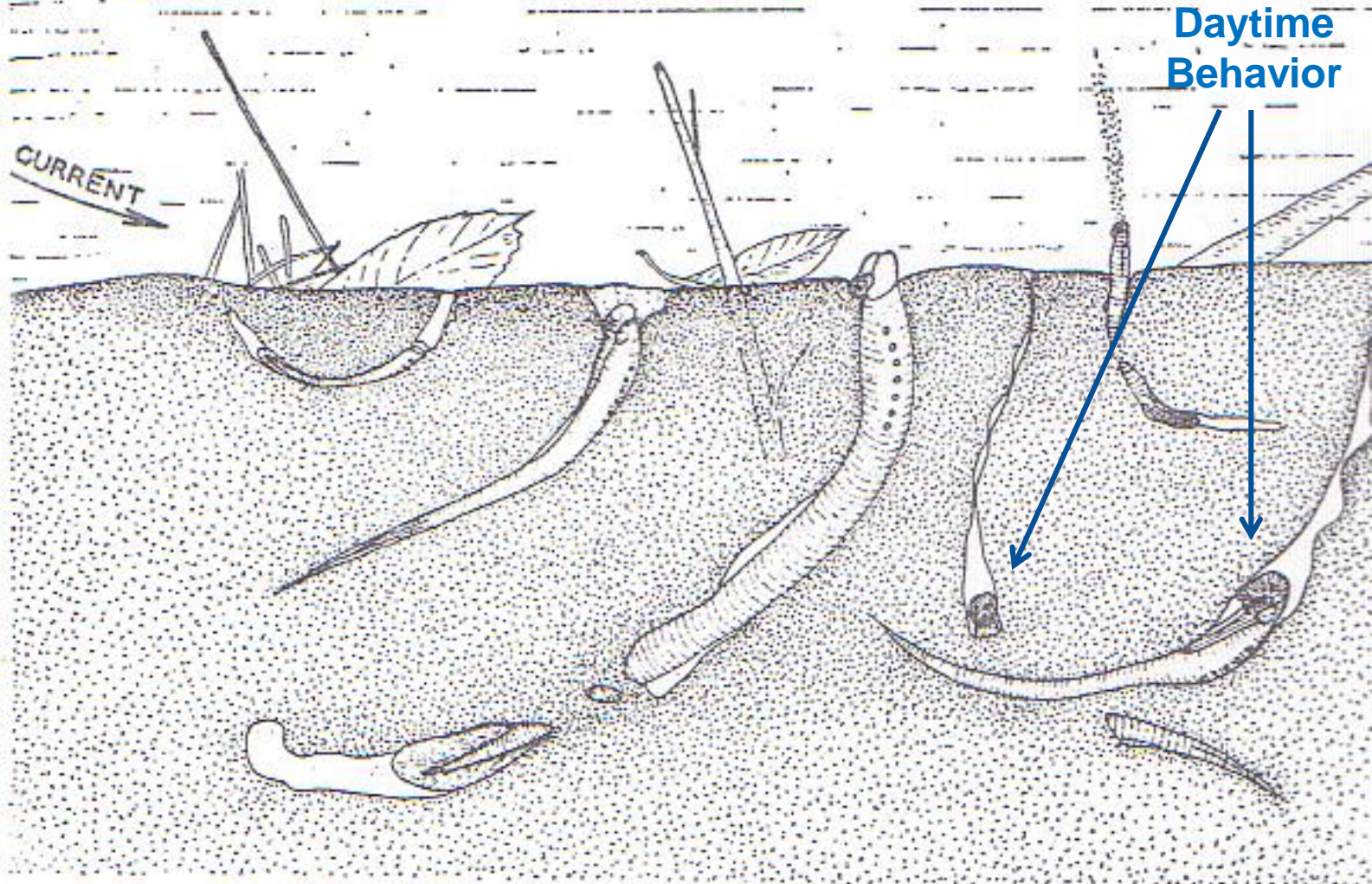
Film Credit: Yuji Seo (Arctic Lamprey from Hokkaido, Japan)





Larval Habitat Needs

Applegate 1950



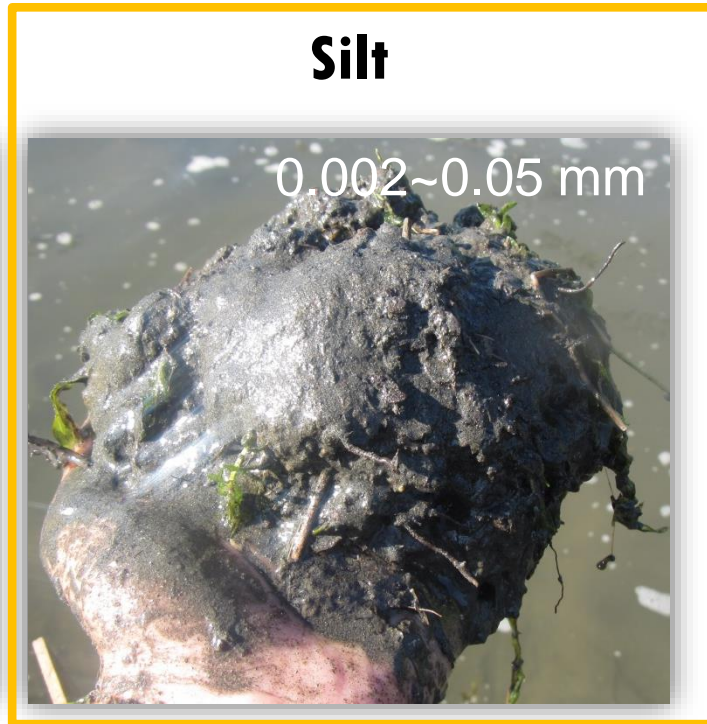
Types of Fine Sediment

Sand



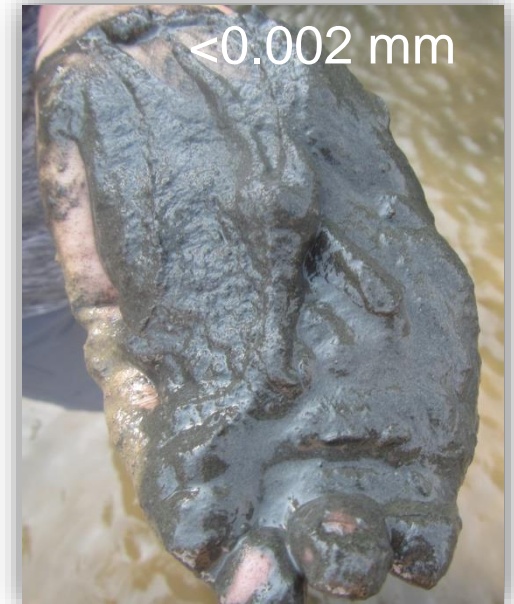
“Gritty”

Silt

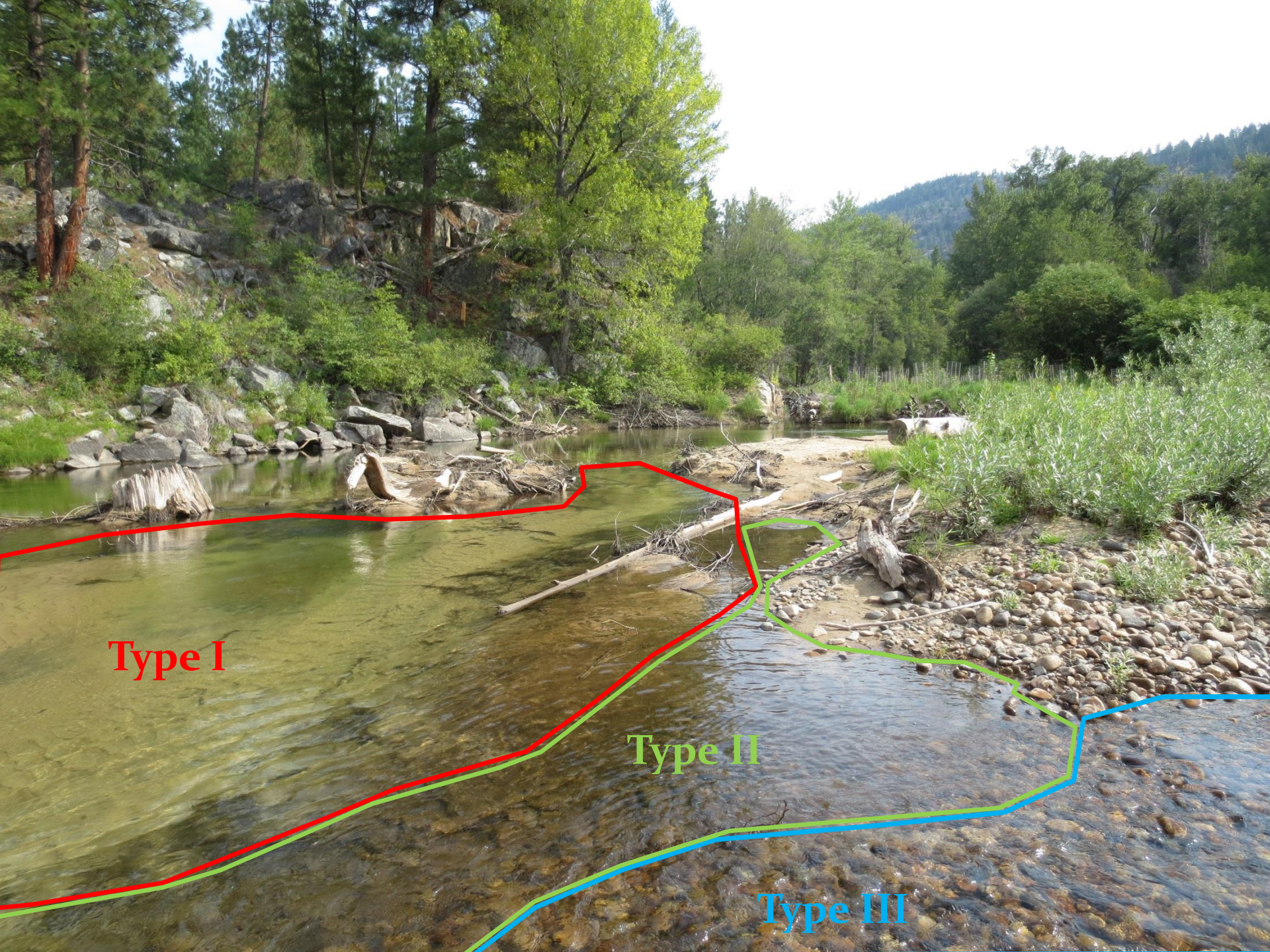


“Smooth”

Clay



“Sticky”



Type I

Type II

Type III

Where?

*Mostly Off-Channel Habitat



Side Channel



Alcove



Channel Edge



Main Channel



Macrophthalmia/Transformers

- Macrophthalmia
 - Prefers swift water, interstitial spaces & undercut banks
- Transformers (resident) generally move upstream

Photo Credit: PSMFC

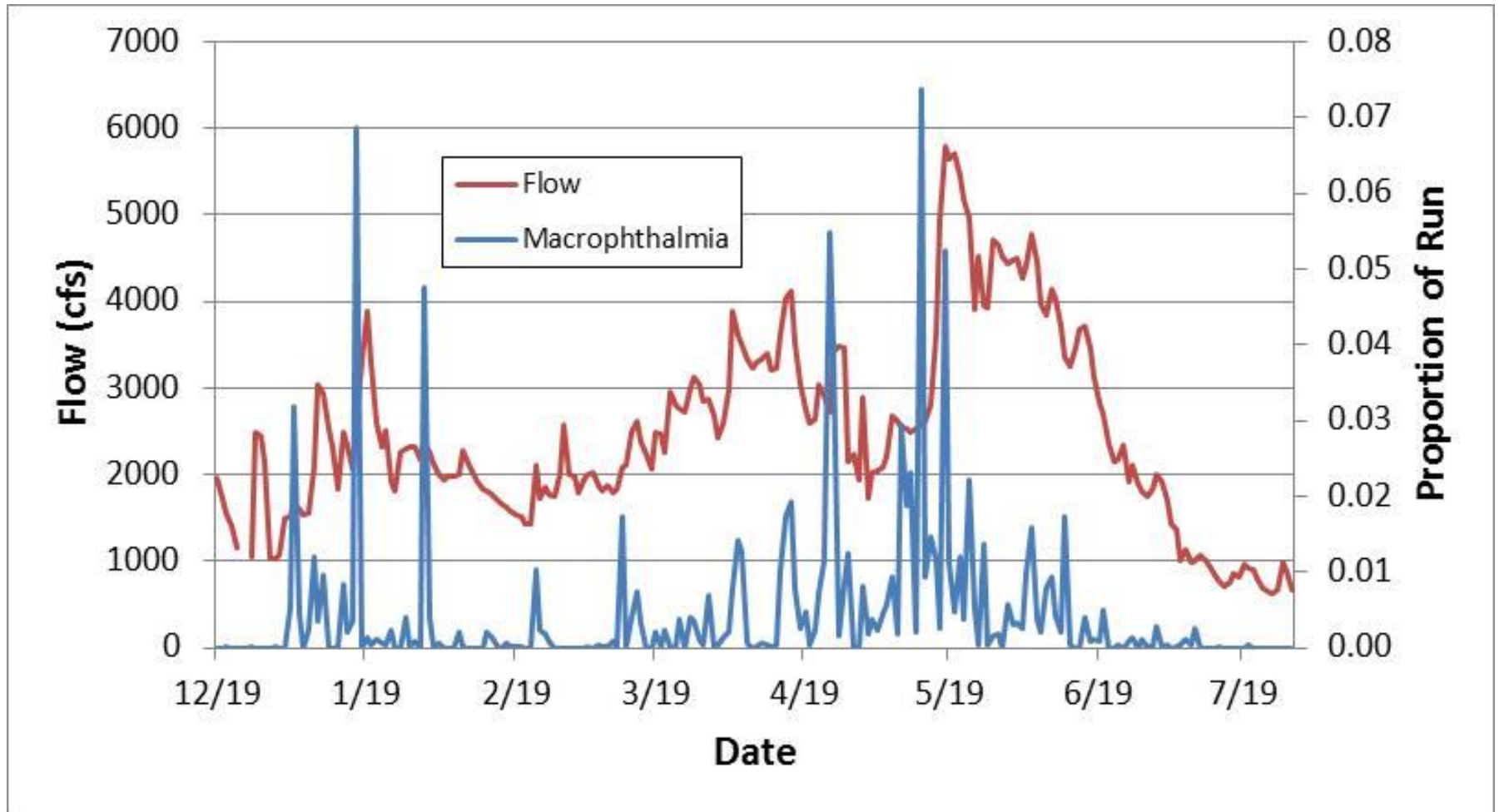


Pacific Lamprey



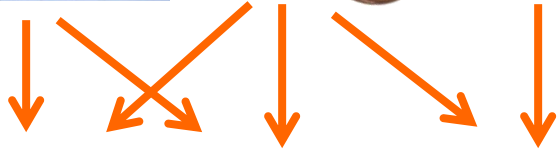
Western River Lamprey

Prosser Dam / Chandler Data





“Indicator Species” for Stream Health



Holding

Rearing

Spawning

Holding
Spawning
Rearing

Supplementation

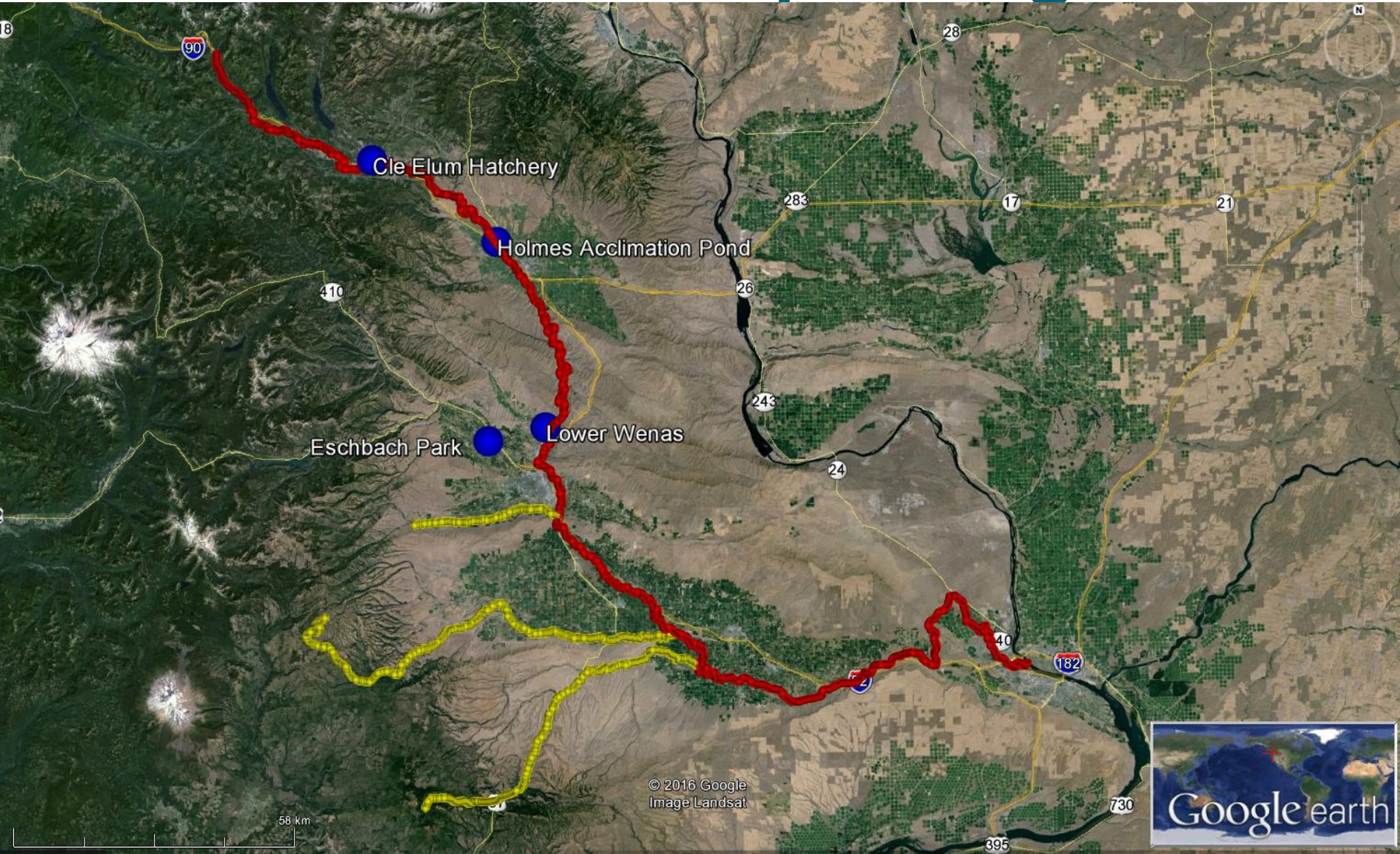


Adult Translocation & Larval Outplanting

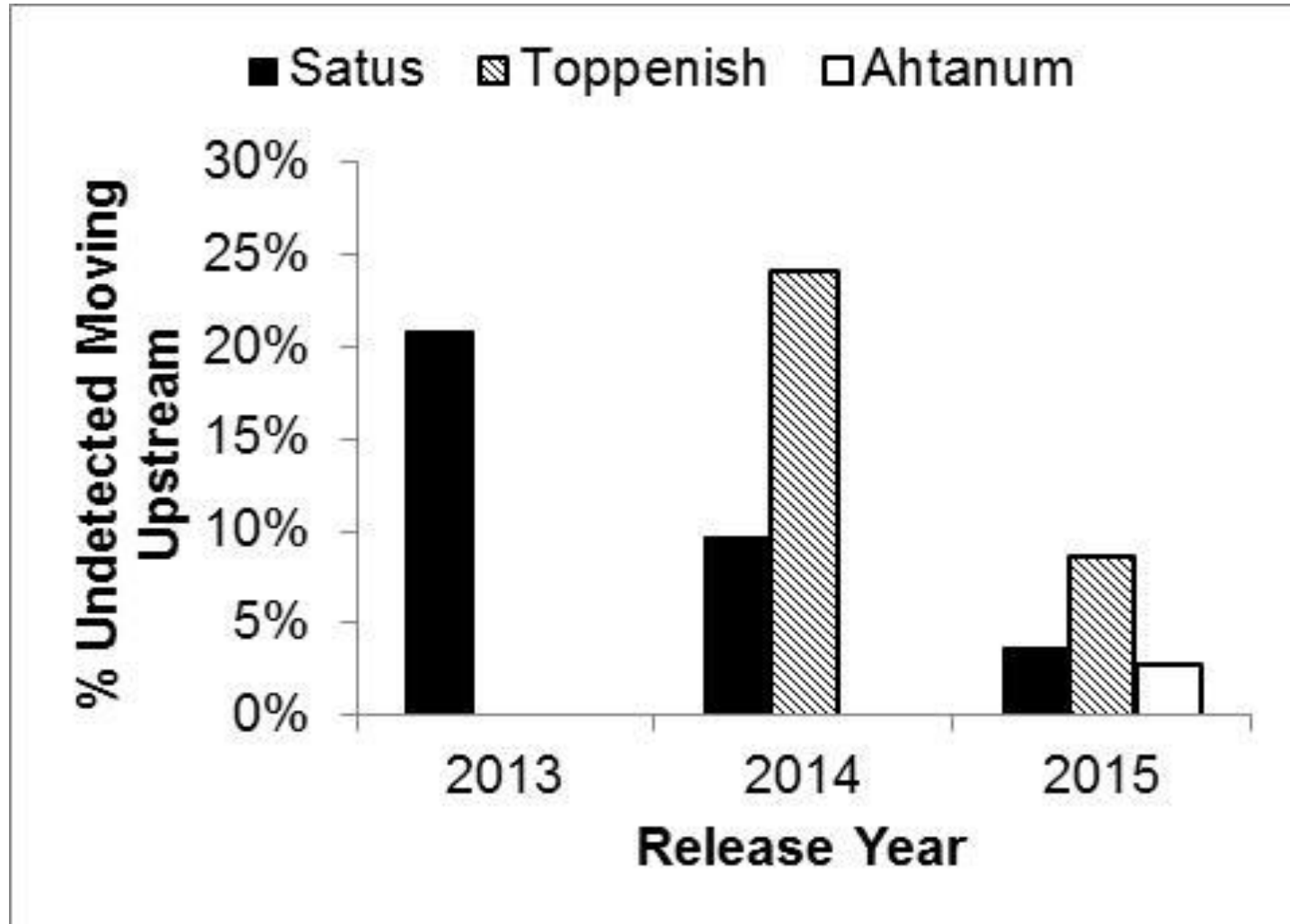
Subbasin	Lower Yakima				Naches	Upper	Lower	Upper	Lower	Upper	Total	
	Stream	Satus	Toppenish	Ahtanum	Yakima	Naches	Yakima	Methow	Methow	Wenatchee		Wenatchee
2011-2012	15	-	-	-	-	-	-	-	-	-	-	15
2012-2013	46	45	46	-	-	-	-	-	-	-	-	137
2013-2014	92	78	85	4	-	-	-	-	-	-	-	259
2014-2015	209	219	201	39	-	102	-	-	-	-	-	770
2015-2016	125	125	125	-	-	-	250	-	80	100	-	805
Total	487	467	457	43	0	102	250	0	80	100	1986	



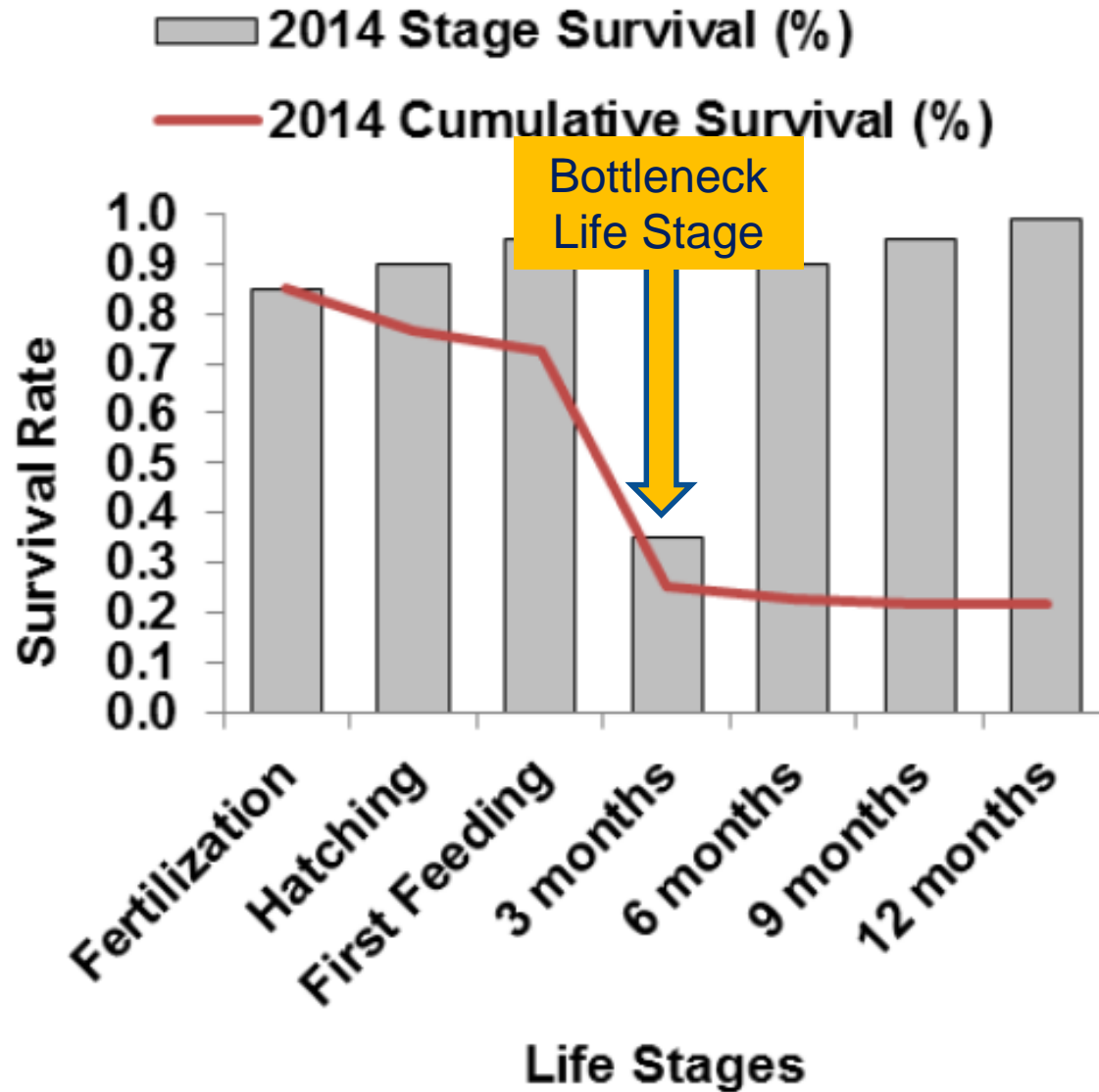
Adult Translocation & Larval Outplanting



Lower Yakima Tributaries “Stream Fidelity”



Life Stage Survival Rates



Tools & Opportunities Available

- PIT / Radio / Acoustic Tagging
- VIE Marking / Coded Wire Tags / Fin Clipping
- Genetic Analyses

Partnership Critical!!!

- Adult Passage Counts (or Trapping)
- Spawning Surveys
- Larval Habitat Surveys (Index Sites / Exploratory)
- Screw Traps / Juvenile Monitoring Facilities

Keystone Species

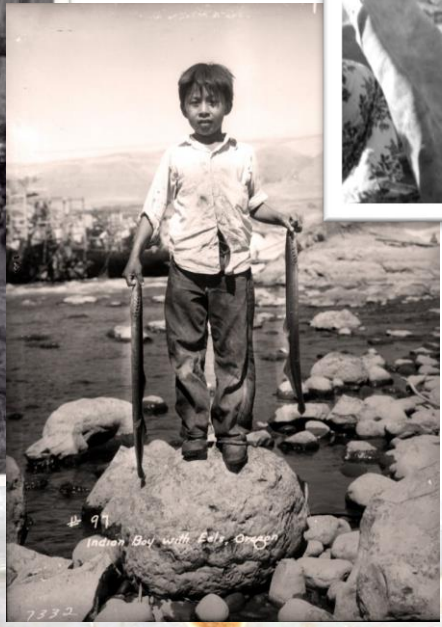
In



eer



Niche Constructor



Questions ???

Ralph Lamp-**rey**-man

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lamr@yakamafish-nsn.gov

