



MOUNT HOOD
ENVIRONMENTAL

Migration Survival of Juvenile Chinook Salmon, Steelhead and Lamprey from Wapato Dam to the Mouth of the Yakima River, Washington, 2018

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³Bureau of Reclamation

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Yakima Basin Science and Management Conference
June 14, 2018

Acknowledgments

- Yakama Nation
 - 38 receivers
 - 900 transmitters
 - Fish and bird predation fieldwork (YN)
- Bureau of Reclamation
 - 200 transmitters
 - Telemetry fieldwork and data analysis (USGS)
 - Fieldwork (USBR)
- Yakima Basin Joint Board
 - Fish predation fieldwork (MHE)
- Kennewick Irrigation District
 - 8 receivers
- McNary Mitigation Fund
 - 100 lamprey telemetry transmitters and fieldwork (YN, USGS)
- Pacific Northwest National Laboratory
 - Assistance with lamprey transmitters
 - Columbia River detection data (McNary Dam to Camas, Washington)

Overview

- Species

- Yearling Chinook salmon ($n = 429$)
- Steelhead ($n = 313$)
- Subyearling Chinook salmon ($n = 400$)
- Lamprey ($n = 97$)

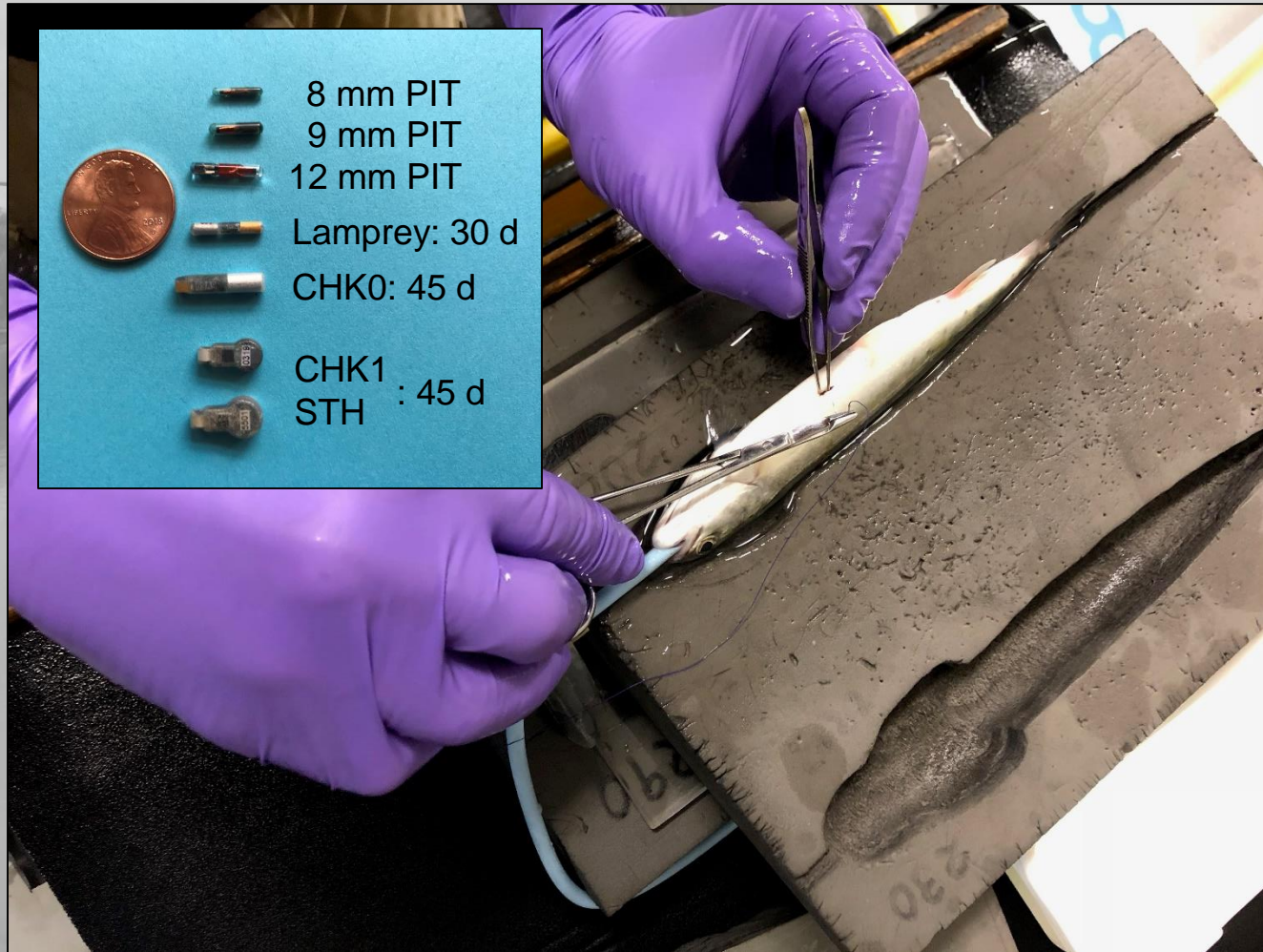
- Study area

- Primary: Lower Yakima River (Yakima to Kennewick)
- Secondary: Columbia River (Kennewick to Camas)

- Duration

- 2018, 2019, 2020
- 2018 is pilot study
- March to July each year

Fish Tagging and Release



Fish Tagging and Release

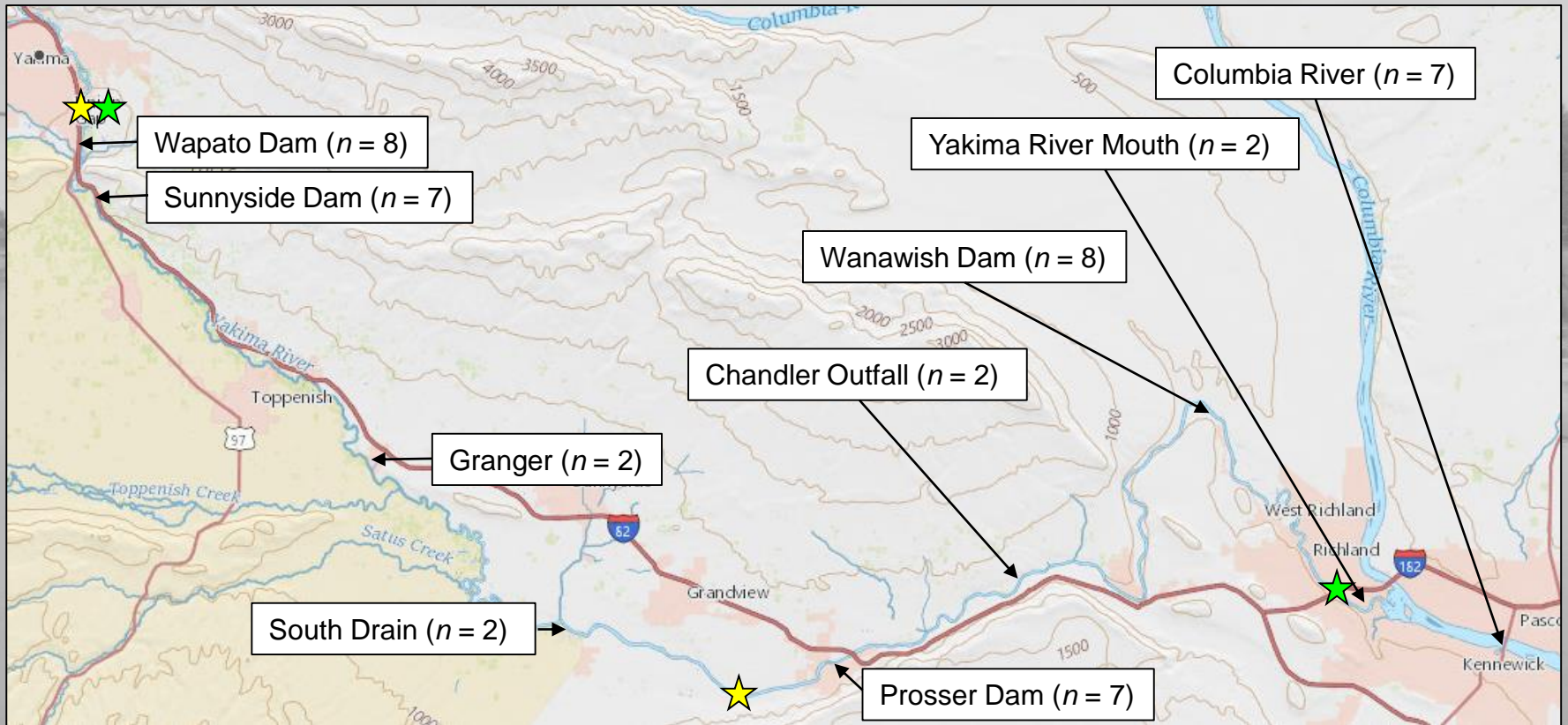
Week	Yearling Chinook		Subyearling Chinook		Steelhead	
	Wapato	Prosser	Wapato	Prosser	Wapato	Prosser
Mar 26-30	30	20				
Apr 2-6	30	20				
Apr 9-13	30	20			30	20
Apr 16-20	30	20			30	20
Apr 23-27	30	20			30	20
Apr 30-May 4	30	20			30	20
May 7-11	30	20			30	20
May 14-18			30	20	30	20
May 21-25			30	20	30	20
May 28-Jun 1			30	20		
Jun 4-8			30	20		
Jun 11-15			30	20		
Jun 18-22			30	20		
Jun 25-29			30	20		
Jul 2-6			30	20		
Totals	210	140	240	160	210	140

350
429

400

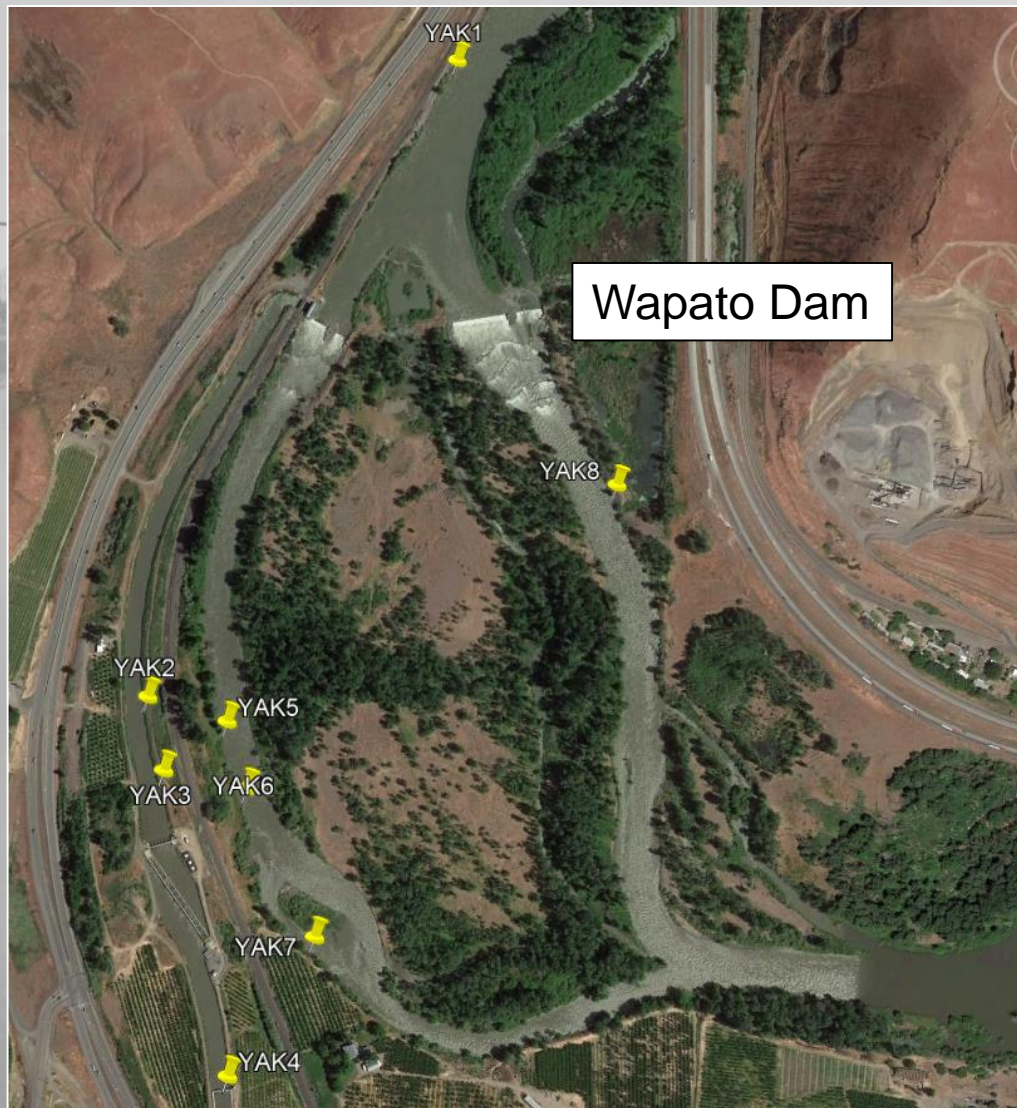
350
313

Study Area and Monitoring Sites



- ★ = CHK, STH release sites
- ★ = Lamprey release sites

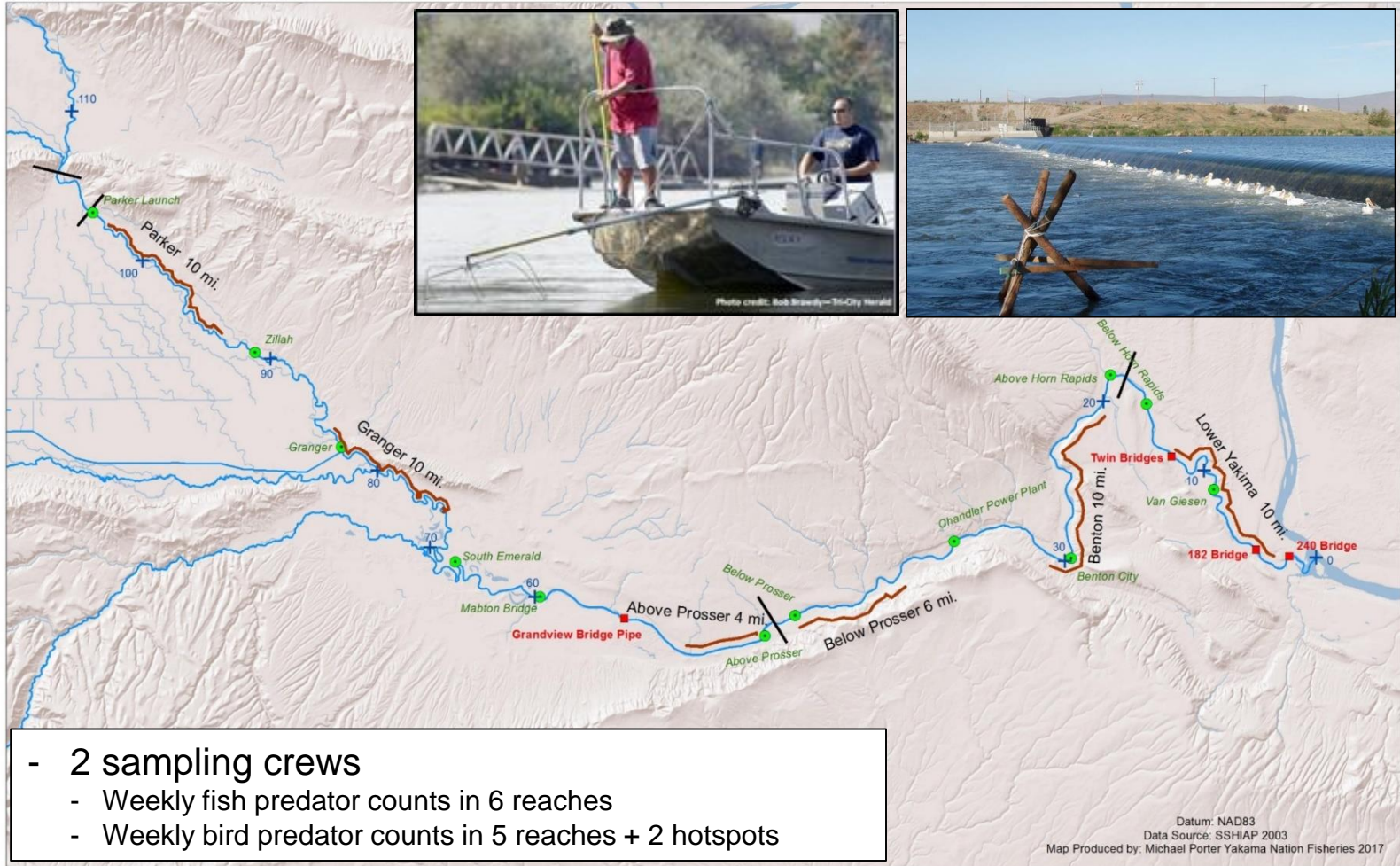
Route-Specific Passage



Survival Covariates

- Fish size, release date
 - From tagging crew at time of tagging and release
- Day of year
 - From telemetry receivers
- Discharge
 - From existing flow gages
- Water temperature
 - From telemetry receivers and thermographs
- Turbidity
 - From predator sampling crew
- Predator index, abundance, and consumption
 - From predator sampling crew

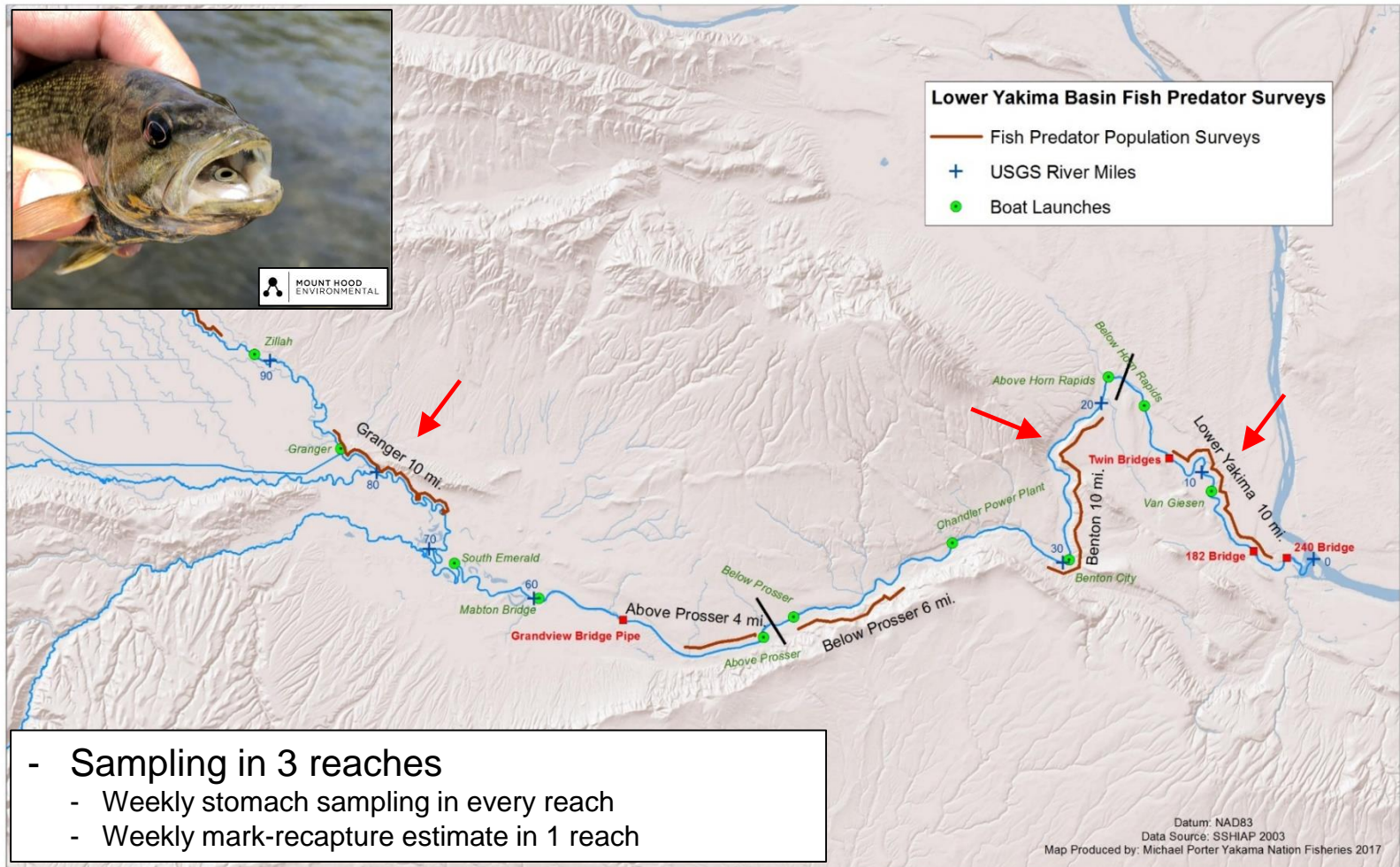
Predator Index Sampling



Predator Abundance and Consumption



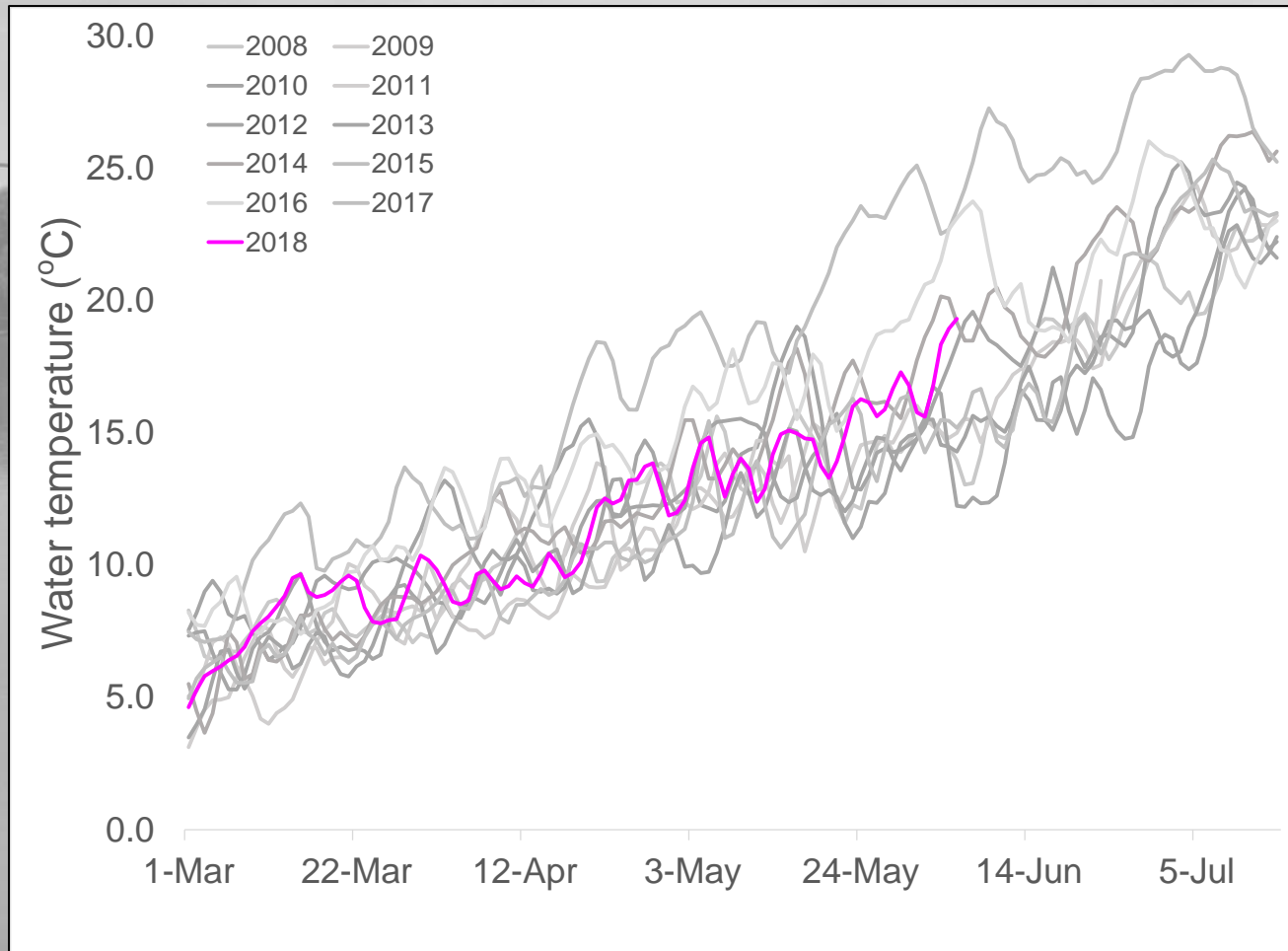
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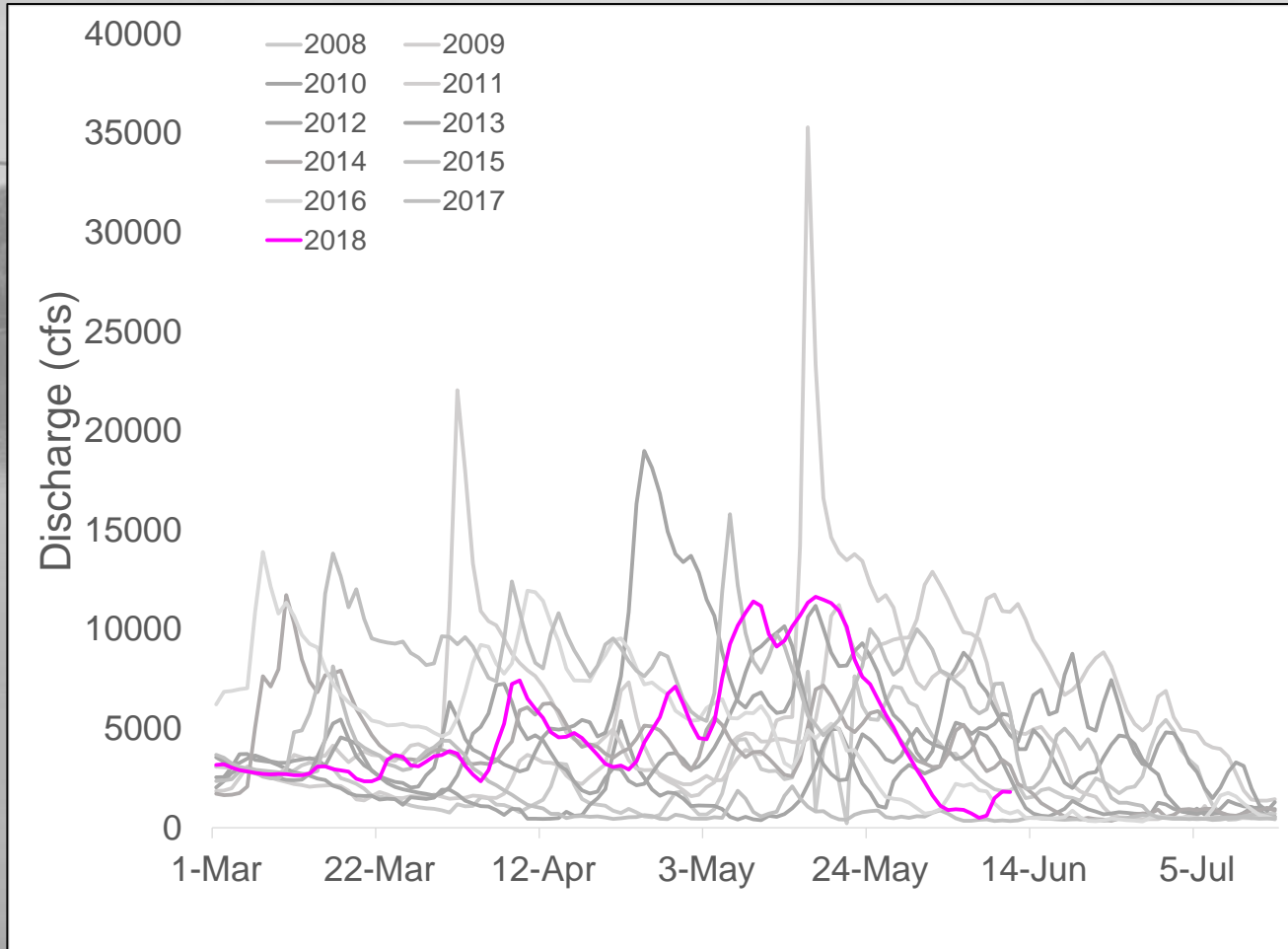
Predator Abundance and Consumption



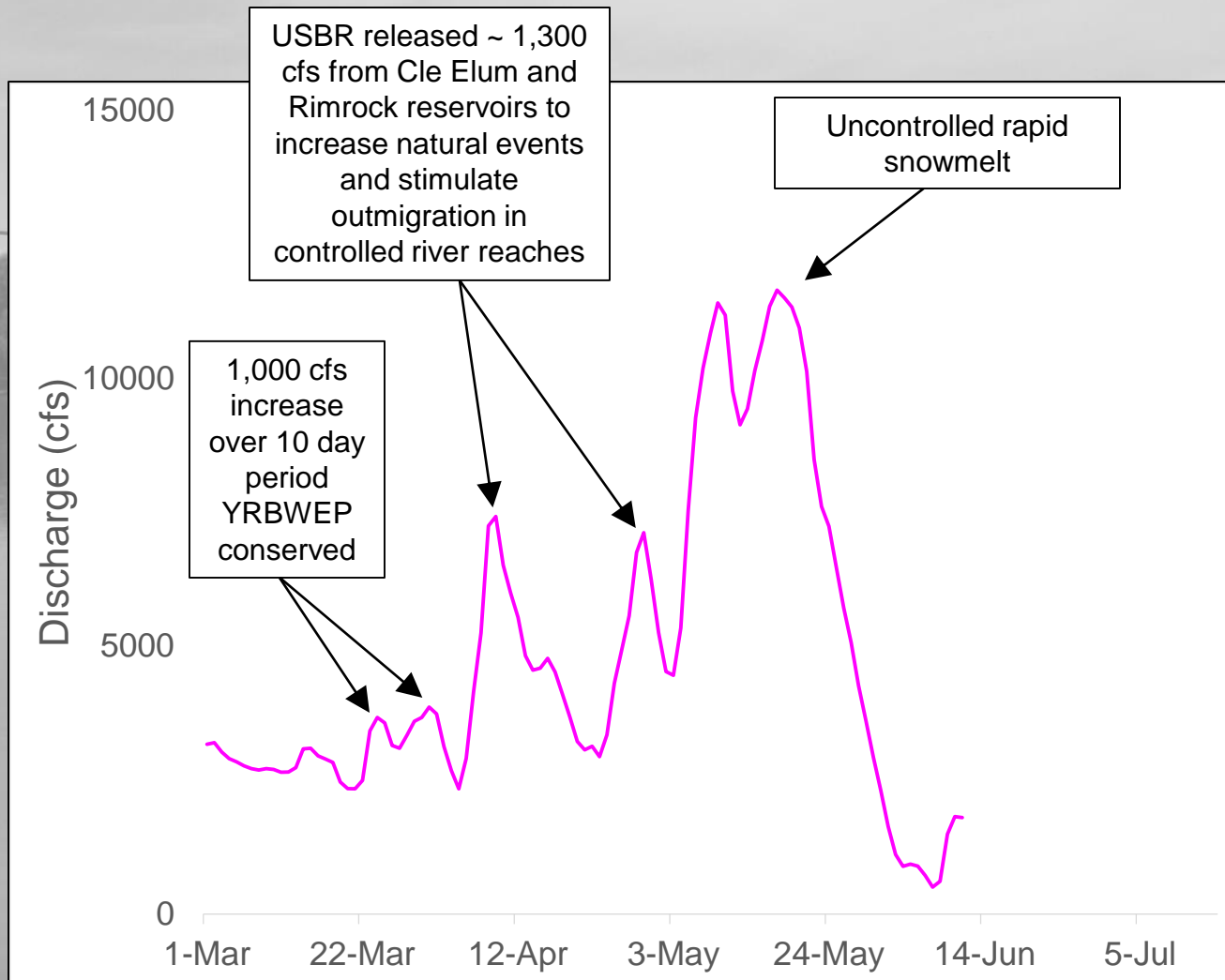
Water Temperature



Discharge



Discharge



Lamprey Tagging and Release

- 97 lamprey tagged and released

- Macrophthalmia

- Mean length = 149.6 mm (SD = 7.9)

- Collection sites

- Ahtanum Creek $n = 5$

- Prosser Dam $n = 25$

- Toppenish Creek $n = 5$

- John Day Dam $n = 14$

- McNary Dam $n = 48$

- Release sites and dates:

- Lamprey “specialists”

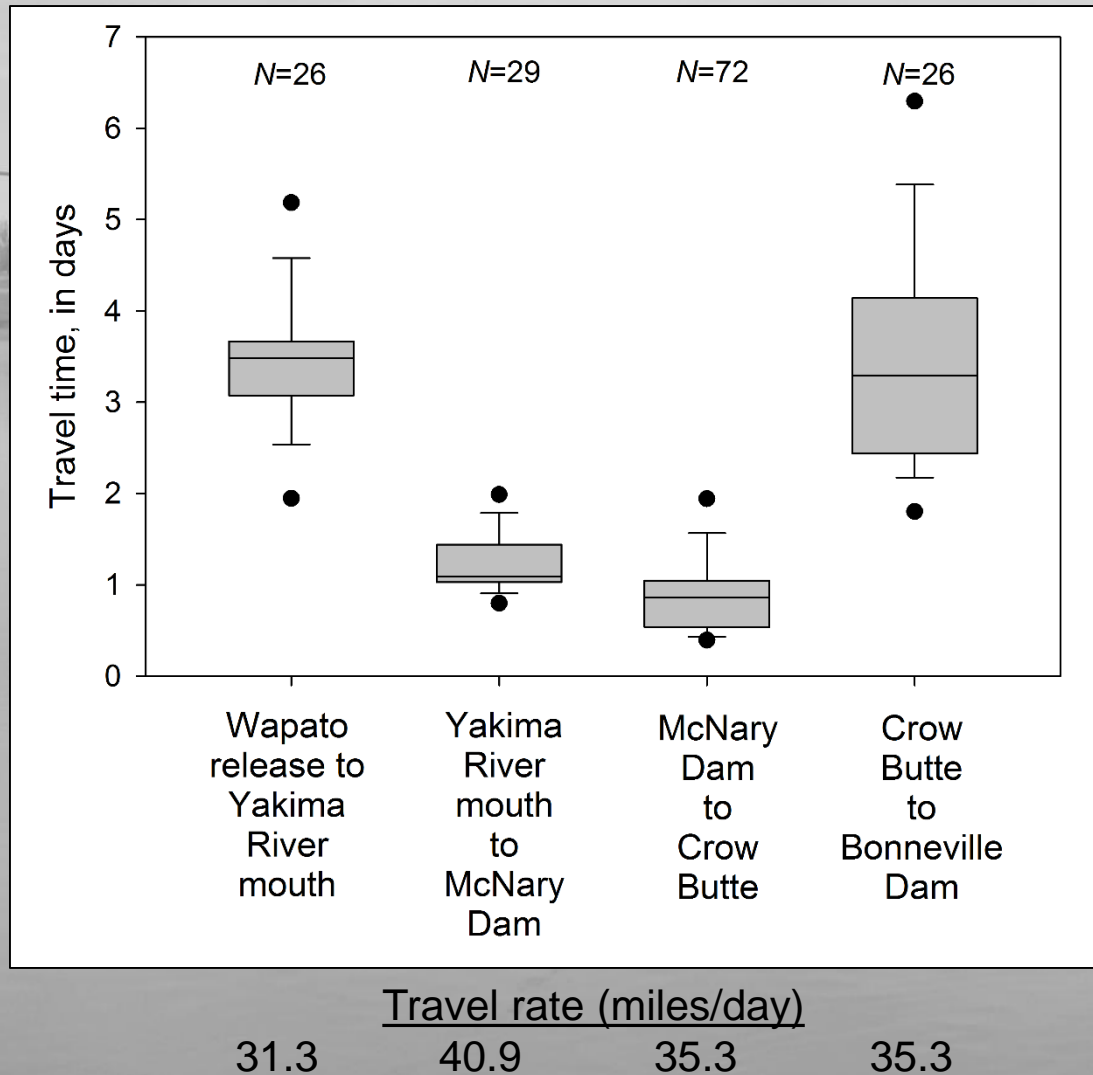
- Ralph Lampman (YN)

- Tyler Beals (YN)

- Theresa Liedtke (USGS)

Date	Release sites	
	Wapato	Yakima River mouth
May 9	19	0
May 10	0	24
May 15	29	25
Total	48	49

Preliminary Lamprey Results



Summary

- Where we're at:
 - A study of "multiples"
 - Years of research
 - Species
 - Entities working
 - Areas of focus
- Where we're going:
 - Results from individual years
 - Provide insights into factors affecting migration survival
 - Inform future study design modifications
 - Results from all years
 - Identify significant factors affecting migration survival
 - Inform development of a decision-support tool

