

PREDATORY FISH IN LOOKOUT POINT AND FOSTER RESERVOIRS



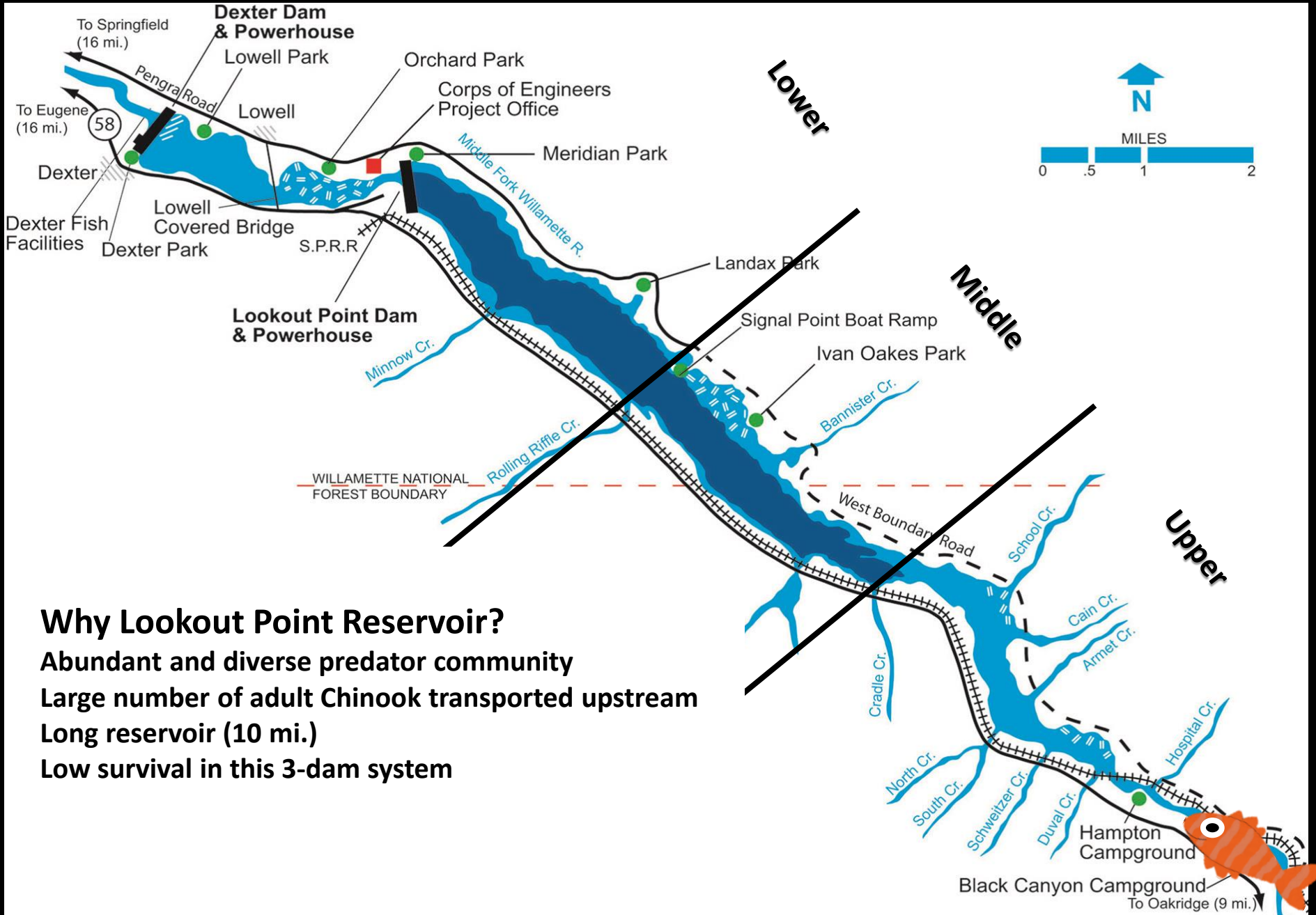
Jeremy D. Romer*
Fred R. Monzyk
Oregon Department of Fish and Wildlife Corvallis Research Lab
Jeremy.Romer2@oregonstate.edu



Objectives

- **Investigate potential impacts of northern pikeminnow on juvenile spring Chinook salmon in Lookout Point Reservoir .**
 - 1) Population estimate for northern pikeminnow in Lookout Point Reservoir**
 - 2) Estimate consumption of Chinook by pikeminnow**
 - 3) Distribution of northern pikeminnow**
- **Assess predation on juvenile spring Chinook and winter steelhead in Foster Reservoir.**
 - 1) Predatory fish community**
 - 2) Predator diet sample analysis**

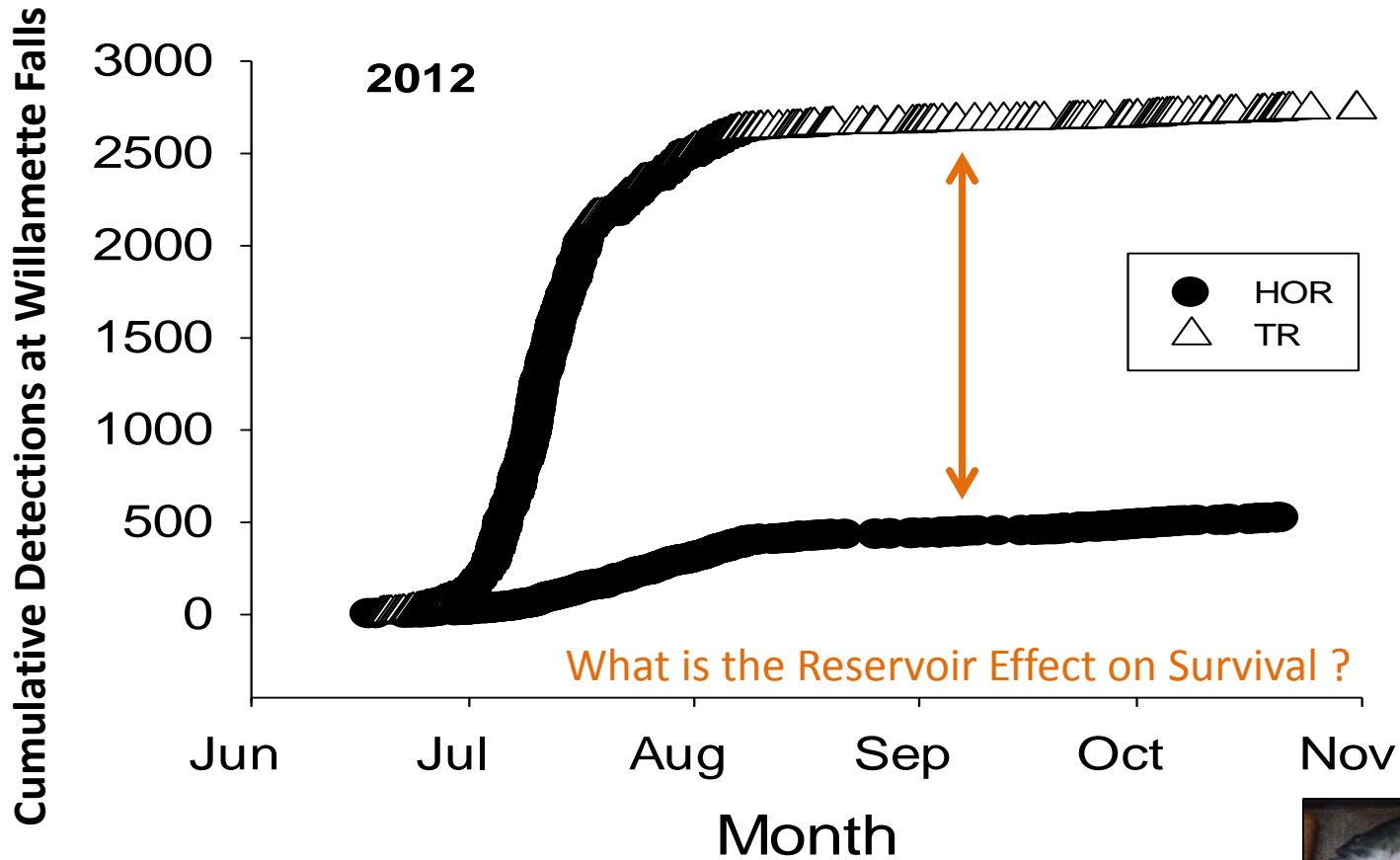
Lookout Point Reservoir



Why Lookout Point Reservoir?

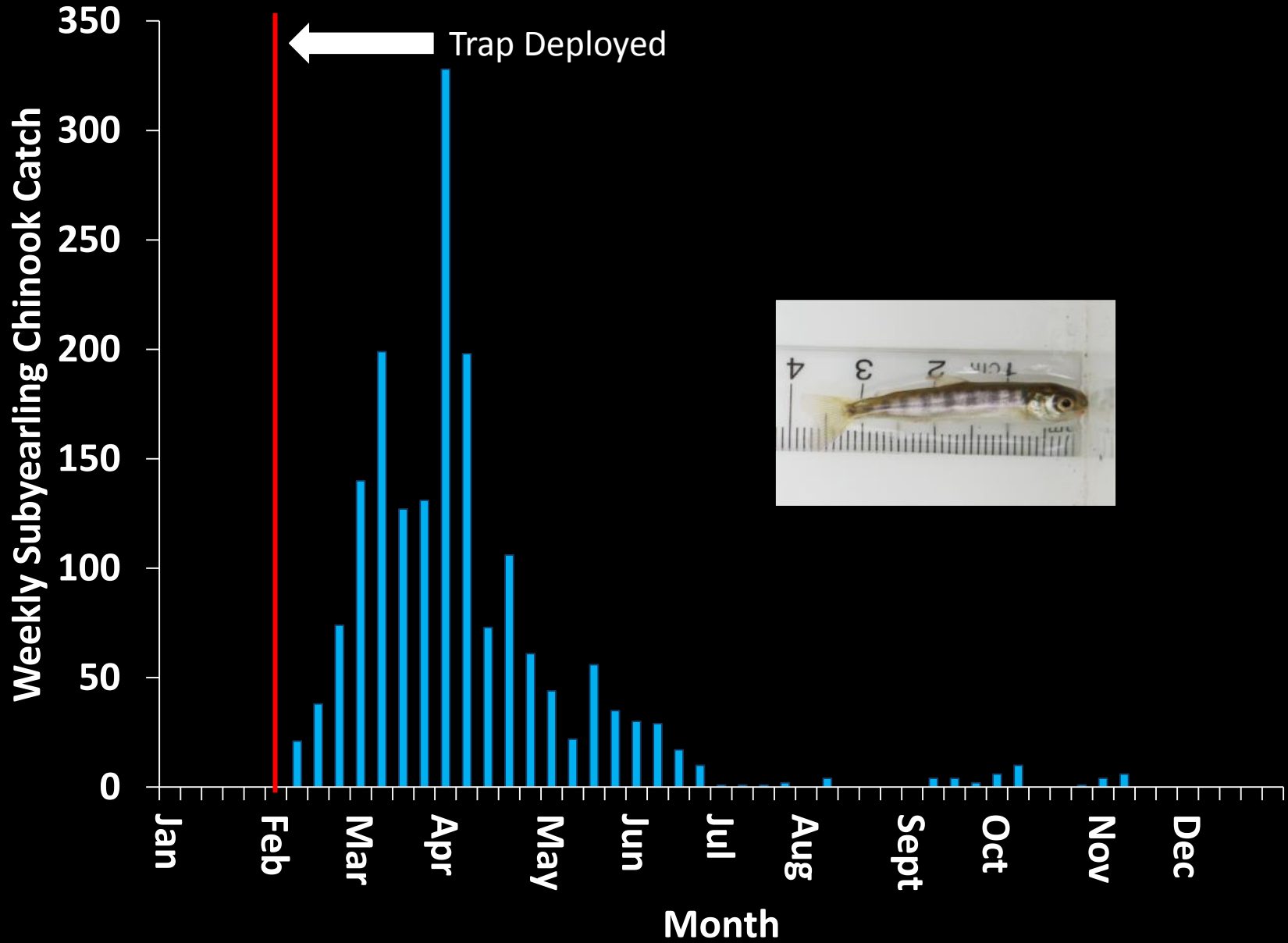
- Abundant and diverse predator community
- Large number of adult Chinook transported upstream
- Long reservoir (10 mi.)
- Low survival in this 3-dam system

2012 Lookout Point Dam – Paired Release Study



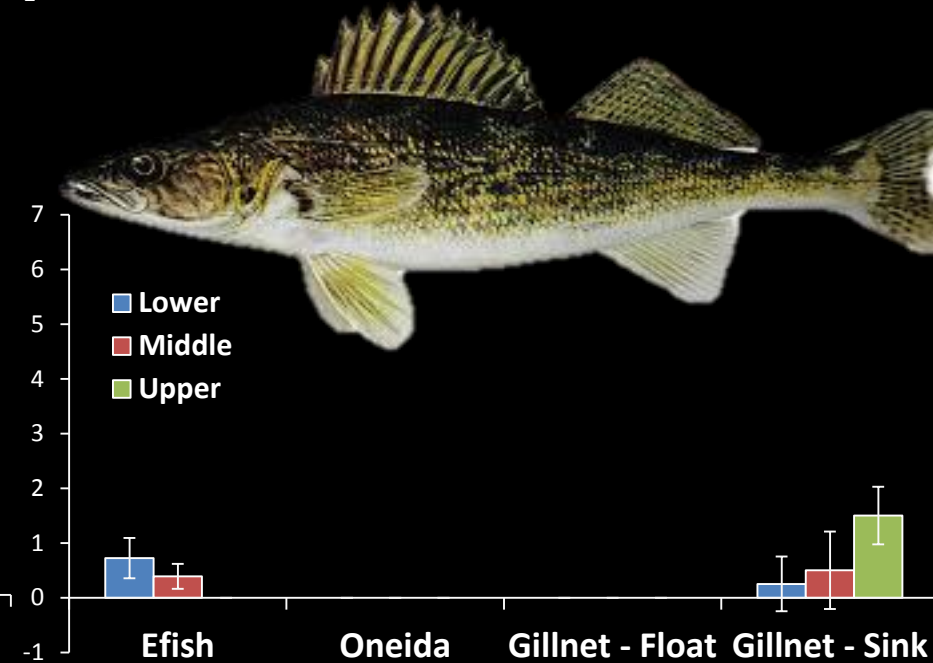
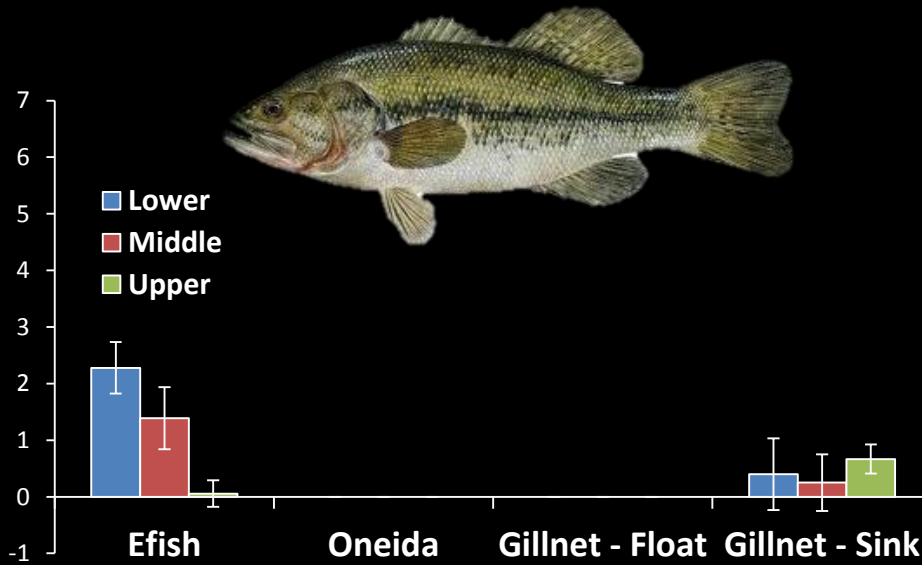
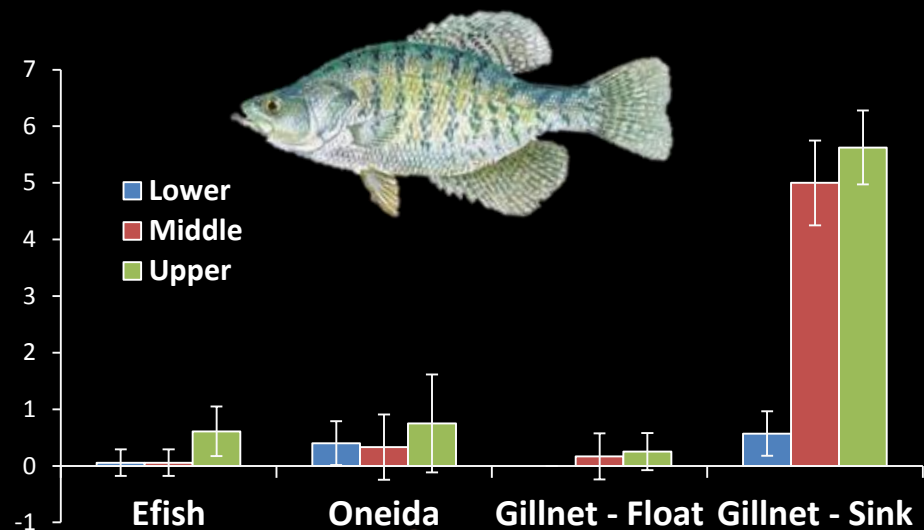
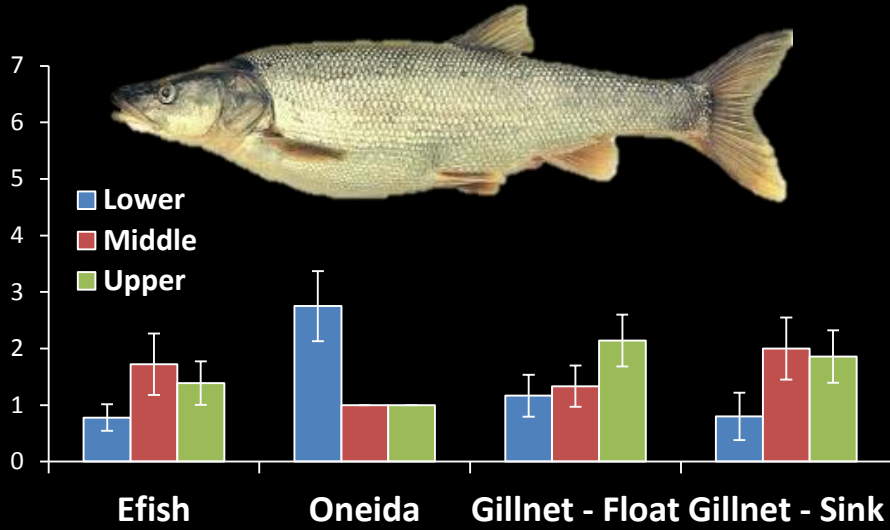
Why Focus on Spring ?

Middle Fork Willamette Screw Trapping Data, 2013



Why Northern Pike minnow ?

Standardized Sampling 2013 - Catch Per Unit Effort (CPUE)



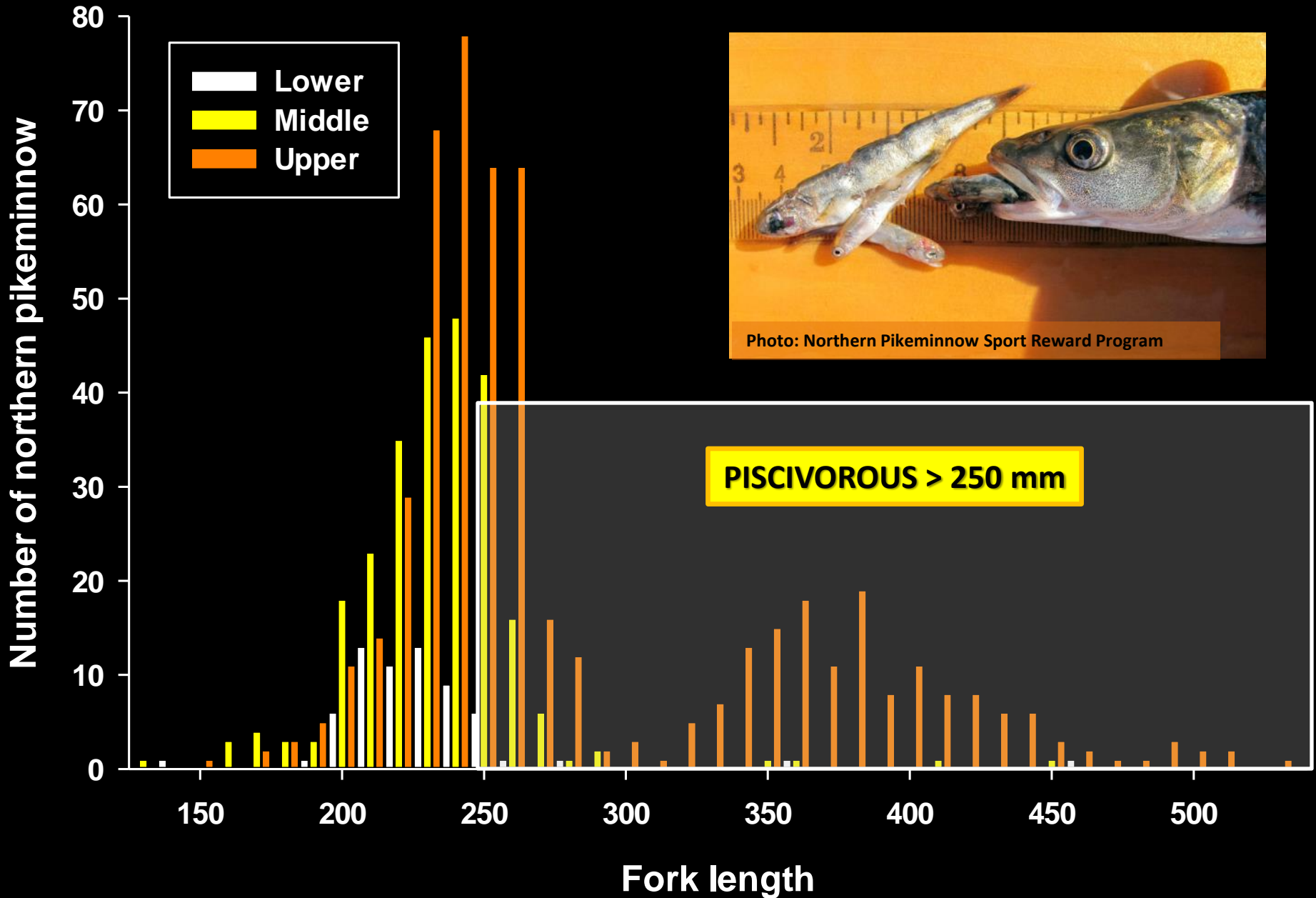
Boat E-fishing 10 wks (April 24 – July 2)



Zone	NPM Tagged	Recaptured	Effort (hrs)	CPUE (NPM/hr)
Lower	112	9	13.6	8.2
Middle	216	21	20.7	10.4
Upper	516	28	34.5	15.0
	844	58	68.8	12.3

Results

Lookout Point Reservoir – Size Distribution



Population Estimate – NPM – Lookout Point 2013

Huggins closed-capture model in program MARK (White and Burnham 1999)

Cormack-Jolly-Seber estimator (open population estimator) to estimate survival

1) between weekly sampling intervals (99.3%) and

2) over the course of our 10 wk season (93.2%)



2,059 NPM captured/scanned at
Dexter Pikeminnow Derby (Jul 27-28)



225 times less likely to recapture a tagged fish in a zone other than the zone where it was initially marked

Population Estimate – NPM – Lookout Point 2013

Model	NPM Estimate	Lower 95%	Upper 95%
Huggins closed-capture model	7,067	5,466	9,224
Heirarchical Bayes Model	32,062	28,534	36,039

c-hat for the Huggins model was 5.9 (acceptable values of < 1) = variance in the data set that cannot be accounted for by our model (overdispersion).

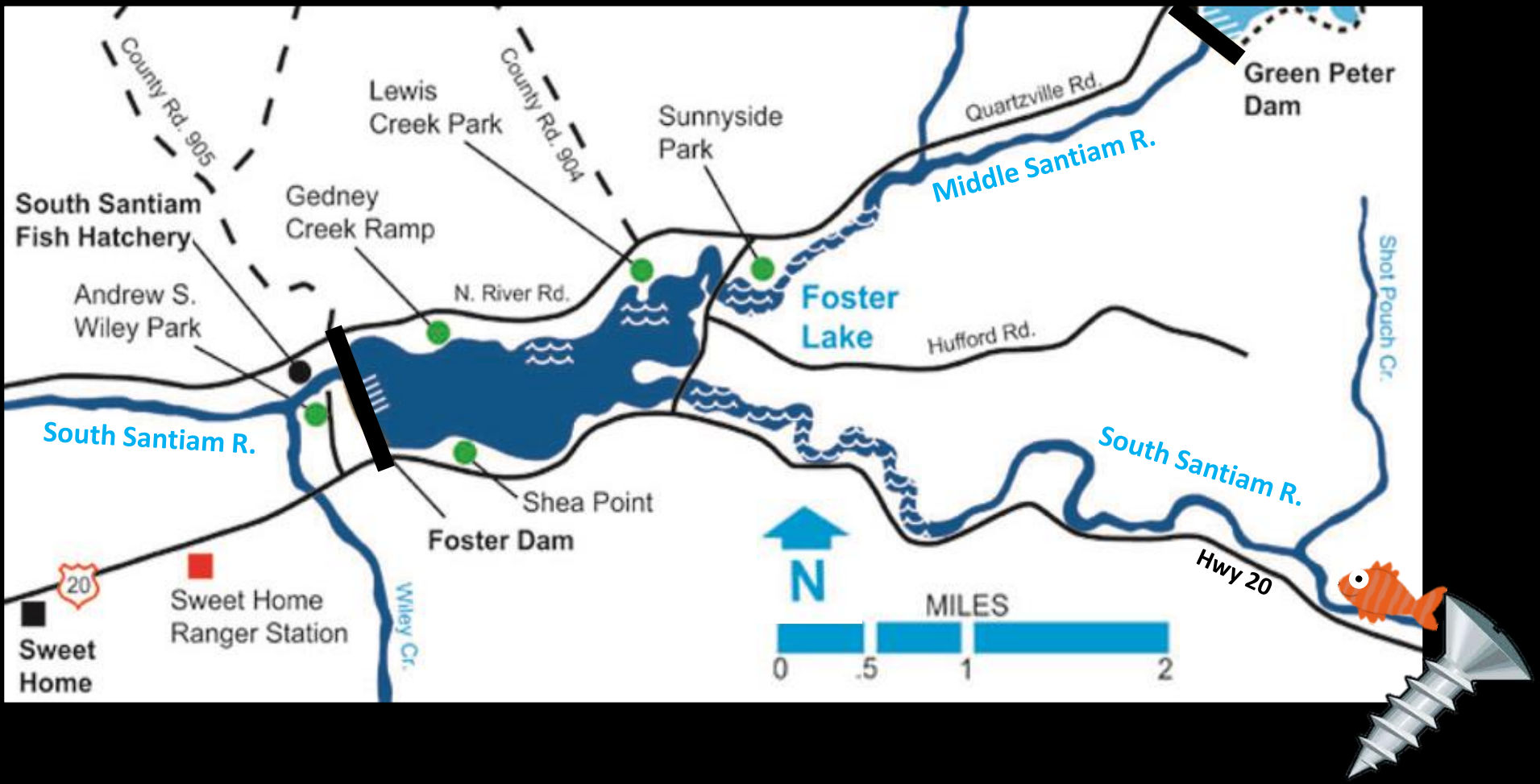
Conservative population estimate (7,067) x

Daily consumption rate for NPM in the spring (0.160 (Monzyk et al. 2012)) x

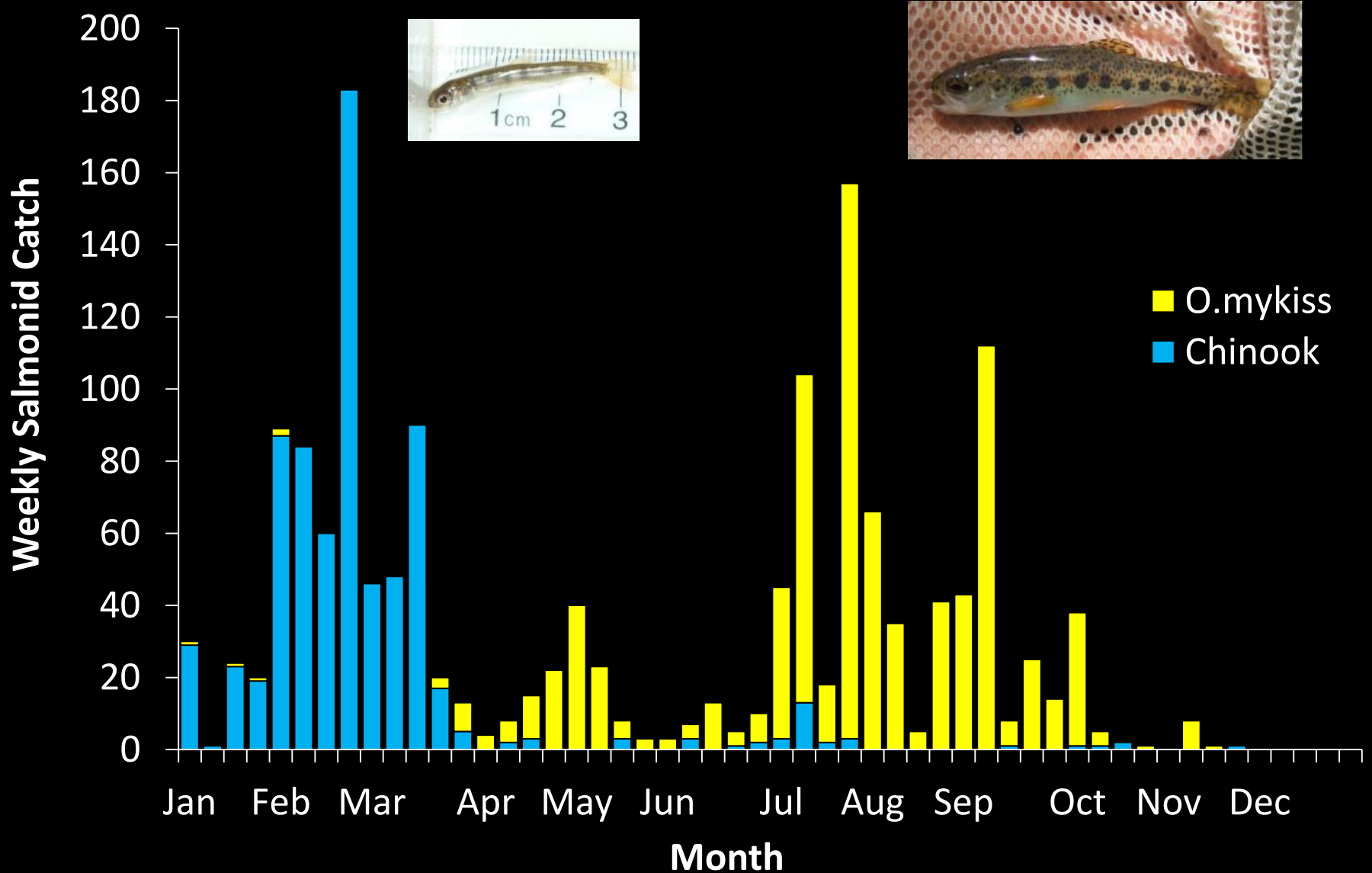
Spring season (90 d) =

101,765 Chinook consumed in the spring – by NPM

Foster Reservoir



South Santiam Screw Trapping Data, 2013



Predators in Foster Reservoir

	Lookout Point	Foster
Piscivorous Species	Number Captured (Fork length range; mm)	
Northern Pikeminnow <i>(Ptychocheilus oregonensis)</i>	140 (197-490)	95 (40-525)
Yellow Perch* <i>(Perca flavescens)</i>	0	128 (54-290)
Largemouth Bass* <i>(Micropterus salmoides)</i>	74 (140-383)	3 (126-440)
Smallmouth Bass* <i>(Micropterus dolomieu)</i>	0	270 (38-383)
Cutthroat Trout <i>(Oncorhynchus clarkii)</i>	12 (84-390)	1 (169)
Rainbow Trout <i>(Oncorhynchus mykiss)</i>	262 (120-445)	300 (57-283)
Walleye* <i>(Sander vitreus)</i>	29 (205-745)	0
Crappie* <i>(Pomoxis spp.)</i>	101 (155-398)	5 (99-120)
Bullhead* <i>(Ameiurus spp.)</i>	22 (176-323)	14 (56-240)

Diet Samples

1) Collect Specimen



2) Remove Stomach

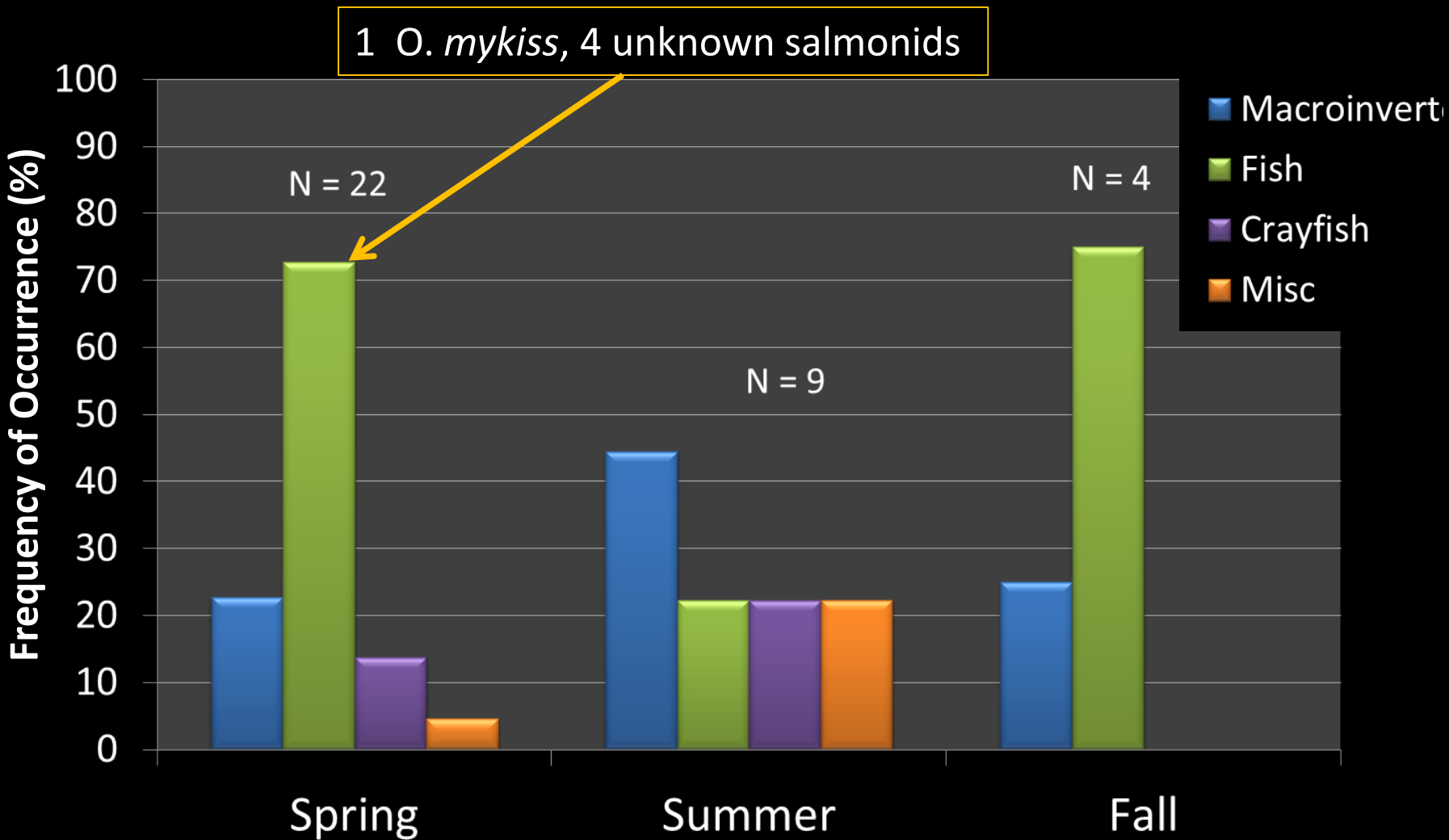


4) Pick and Bone Identification



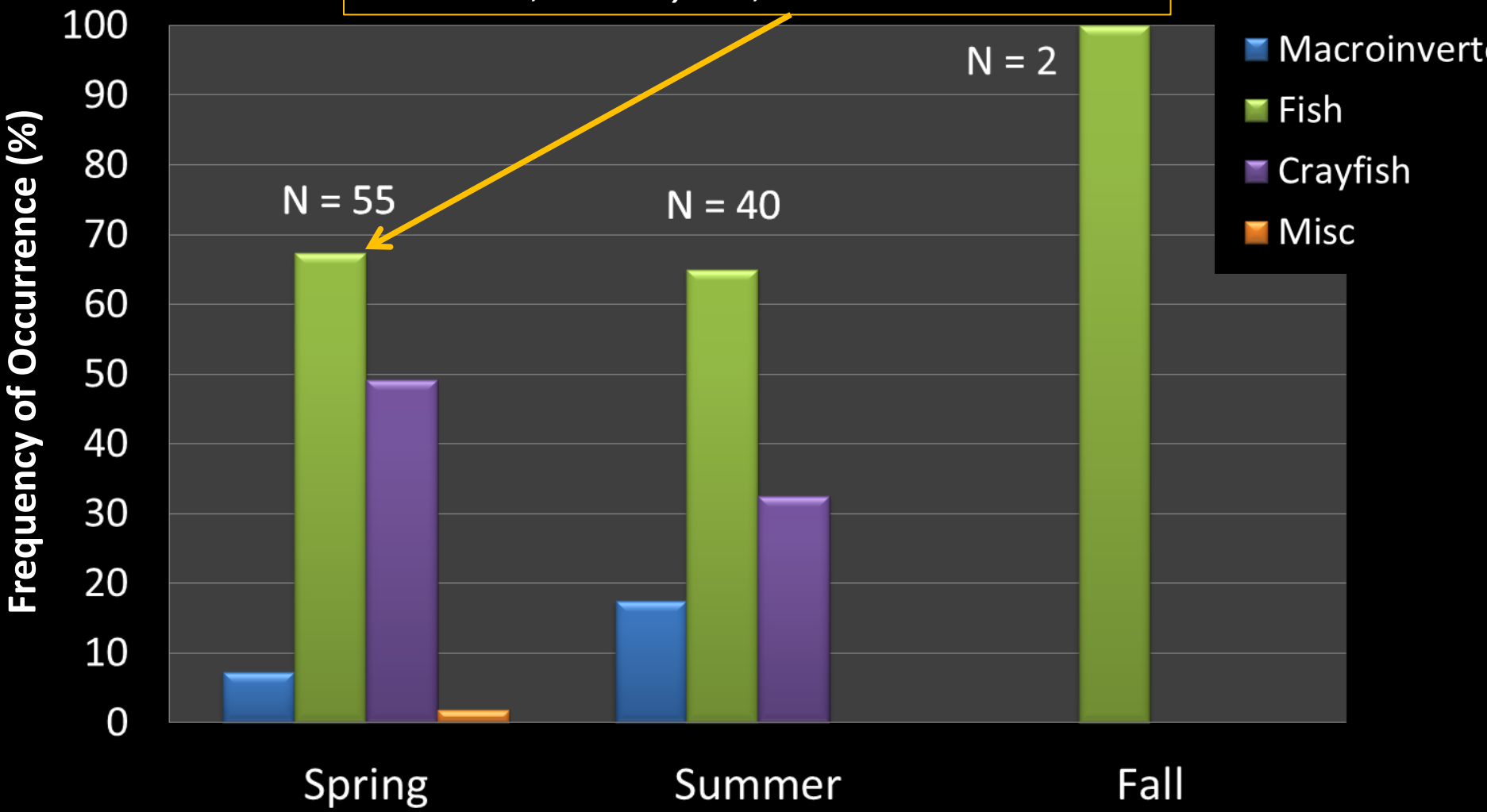
3) Bake

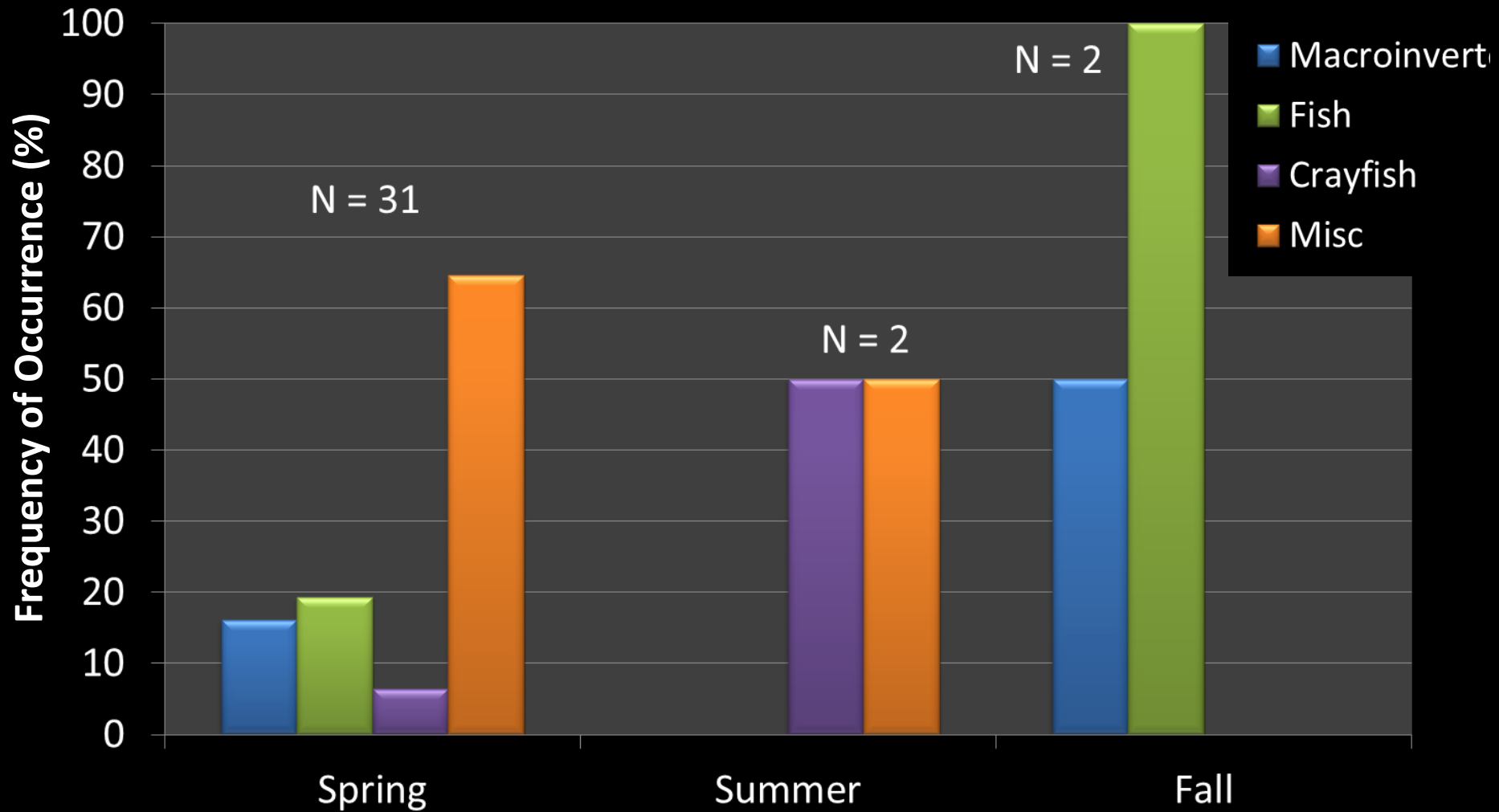






7 Chinook, 6 *O. mykiss*, 2 unknown salmonids





Conclusion:

Lookout Point

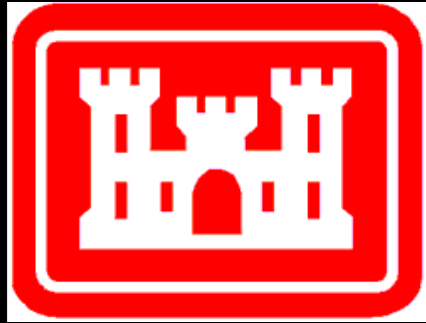
- 7,000 NPM in Lookout Point is likely an underestimate.
- Using the conservative estimate, NPM have an impact on juvenile Chinook survival (> 100,000 in spring).
- Highest density and largest NPM in the upper section of the reservoir in spring (when Chinook enter).
- Refine spatial information to increase capture efficiency and decrease c-hat.

Conclusion:

Foster

- Variety of predators (slightly different than Lookout Point).
- Smaller reservoir. Juveniles (Chinook, winter steelhead) are able to exit the reservoir in a more timely manner.
- Predatory fish eat *O. mykiss* and juvenile Chinook in Foster, particularly bass in the spring.

Acknowledgements



Greg Taylor
Chad Helms
Doug Garletts
Rich Piaskowski



Ryan Emig
Khoury Hickman
Chris Abbes
Kris Clemons
Greg Gilham
Mario Minder
Meghan Horne-Brine
John Elliott
Kevin Stertz
Matt Walker
Keenan Smith
K8 Self



Jeff Ziller



Jim Peterson