

# Juvenile Migration: Rotary Screw Trap Operations 2024

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July 2024 PGE Fisheries Workshop



# Outline

- Objectives
- Methods
- Results



# Objectives

**OBJECTIVE 1:** Estimate the number of smolts entering Lake Billy Chinook (LBC) from each tributary.






**OBJECTIVE 2:** Determine the timing and numbers of smolts emigrating from Lake Billy Chinook.

**Objective 3:** Determine the percentage of fish entering Lake Billy Chinook that are successfully captured at the SWW.

**OBJECTIVE 4:** Determine travel times and relative survival of each species to the mouth of the Deschutes River and Bonneville Dam.





	PGE/CTWS Dam
	Other Dam
	River/Creek/Reservoir/Lake
	Town
	Screw Trap



# Methods

## Estimate natural production of spring Chinook smolts

- Capture, identify & count
- PIT tag (naturally spawned- intact)

## Using previously estimated trap efficiency

- Calculate tributary production (Obj. 1)  
(Carlson et. al. 1998)
- Calculate travel time to SWW (Obj. 2)

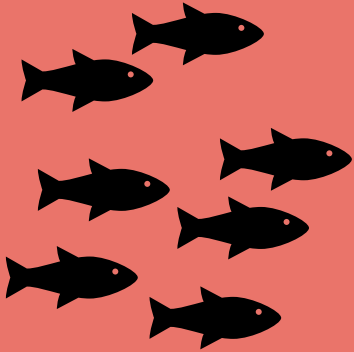
## Additional effort

- ID and count all other fish collected

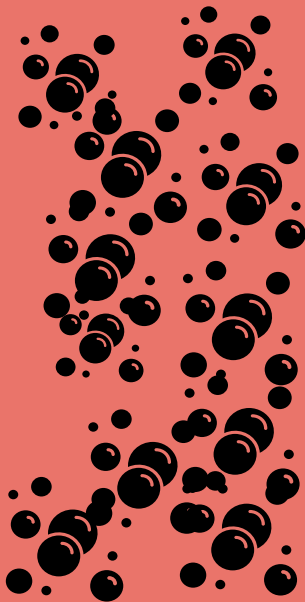


# Methods: Conceptual model related to smolt collection at Monty Trap

2022: 228



Egg Production



Parr to Smolt Survival

Fry released in Metolius by Year

2016	285,500
2017	108,680
2018	292,500
2019	232,000



Rotary Screw Trap Collection Efficiency

Number of smolts tagged at Monty trap

2017	576
2018	517
2019	0
2020	502

3 Year Trap Efficiency

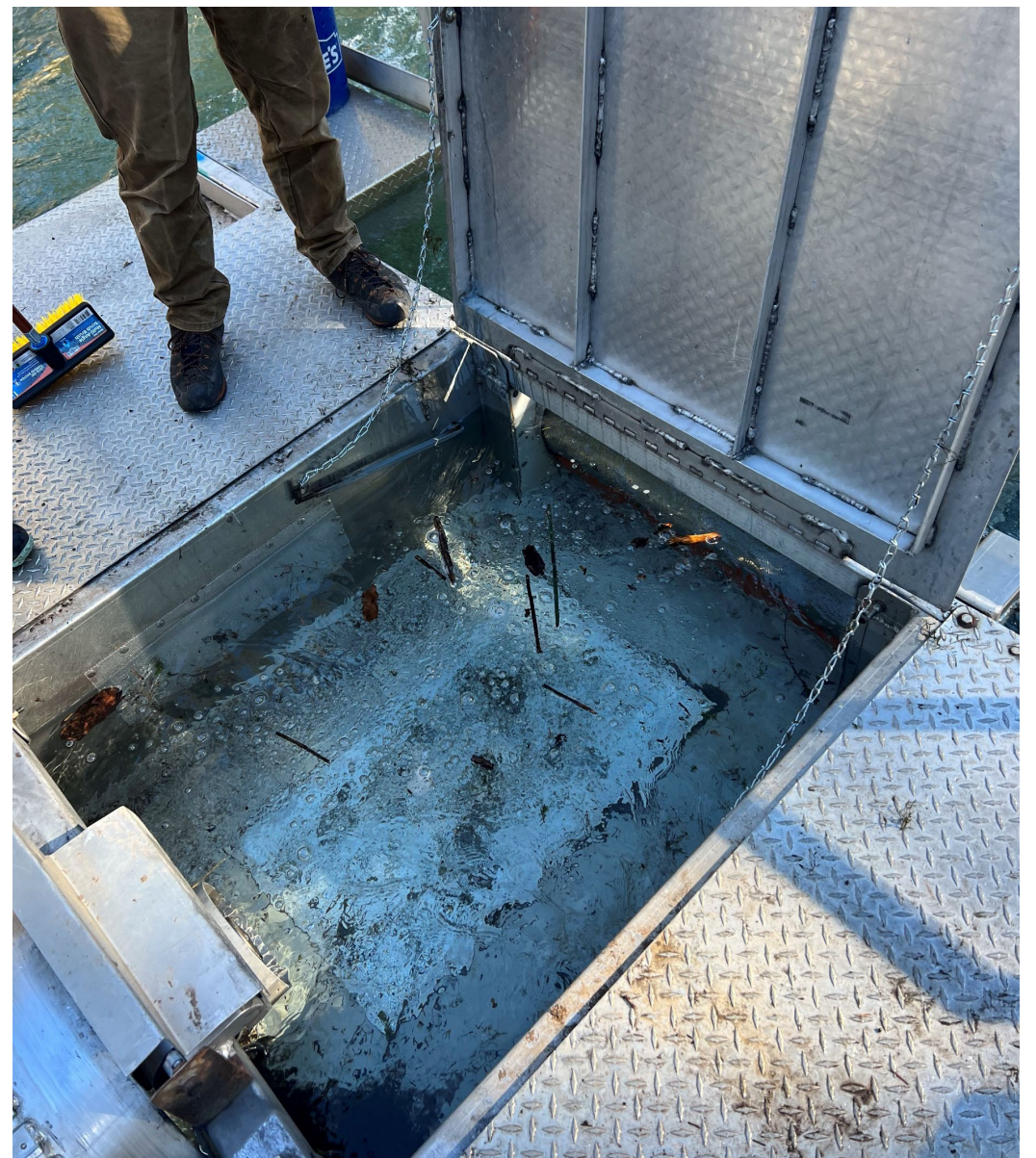
11.60%



# Monty screw trap results

## Trap operated:

- February 13 - May 5, 2024
- Days in the field: 83
- Days operated :71
- Three pre-emptive shutdowns
- One mechanical failure
- Total of 1,639 hours



# Monty screw trap results

## Captured:

Wild Chinook 103 → PIT tagged 101

HR Chinook - 48

Bull trout - 589

## Other species:

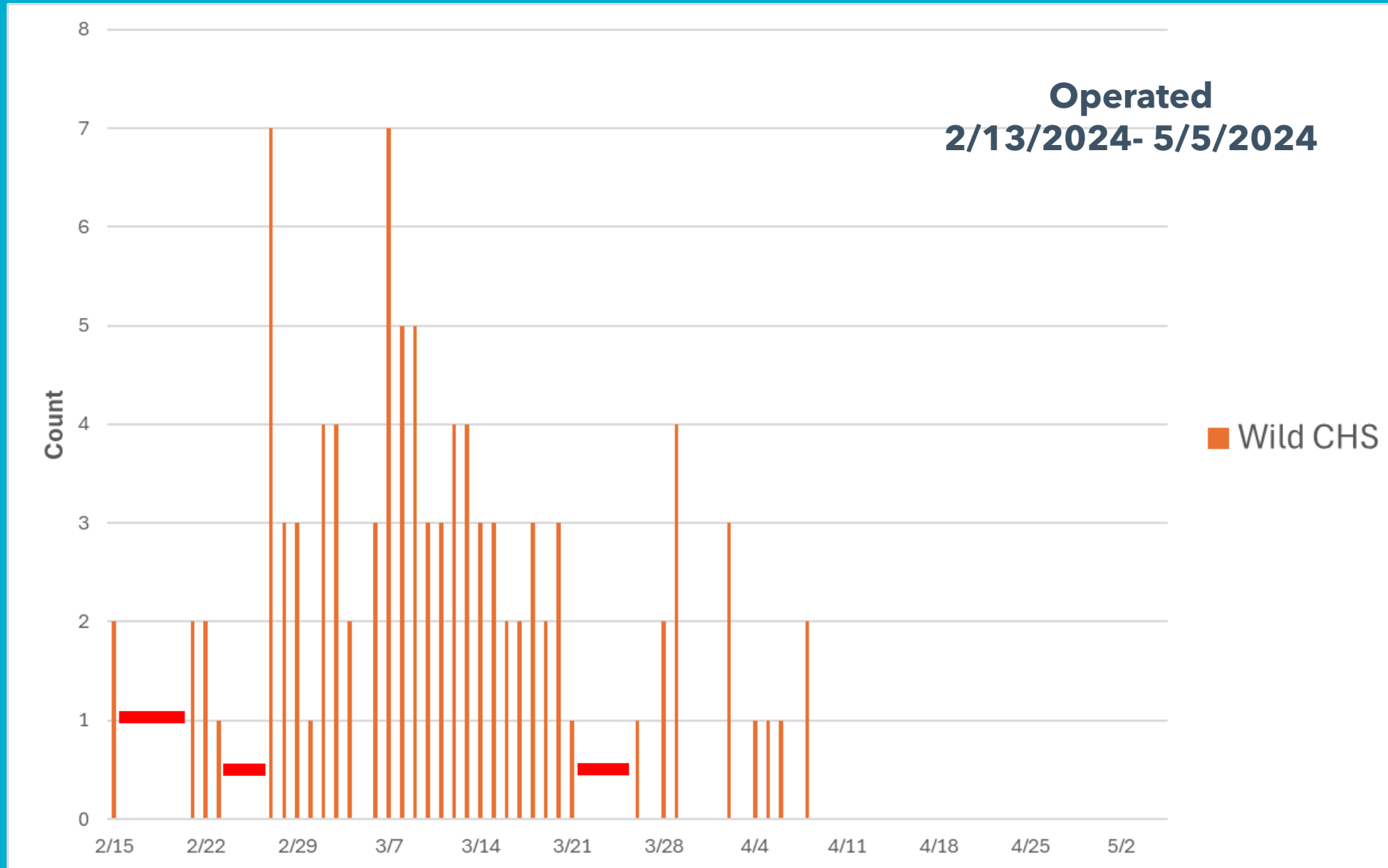
- Sockeye fry - 491
- Red band trout - 1
- Mountain whitefish - 104





# Determine the timing of smolts emigrating from Lake Billy Chinook;

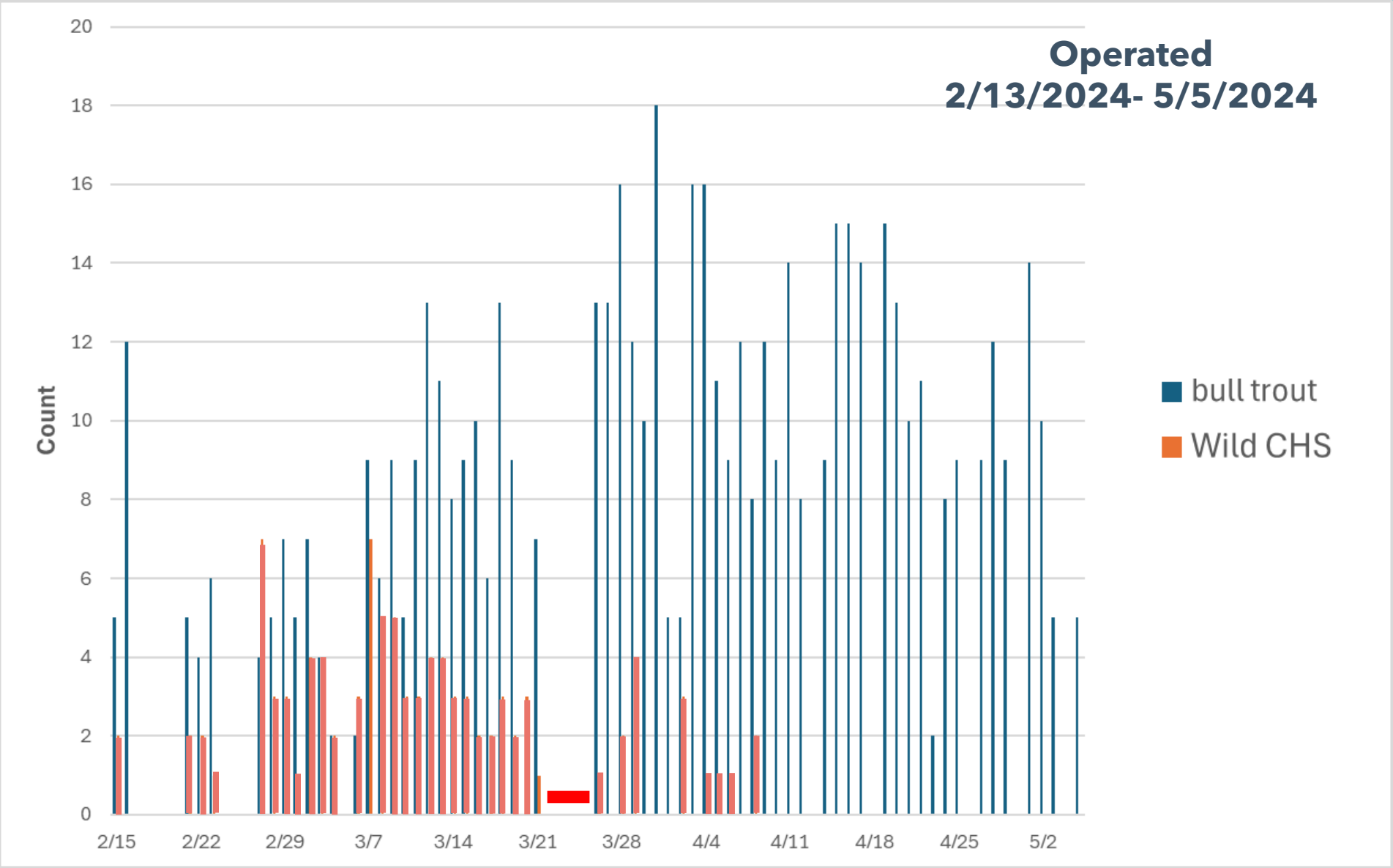
## Natural Production spring Chinook (n=103) captured by day



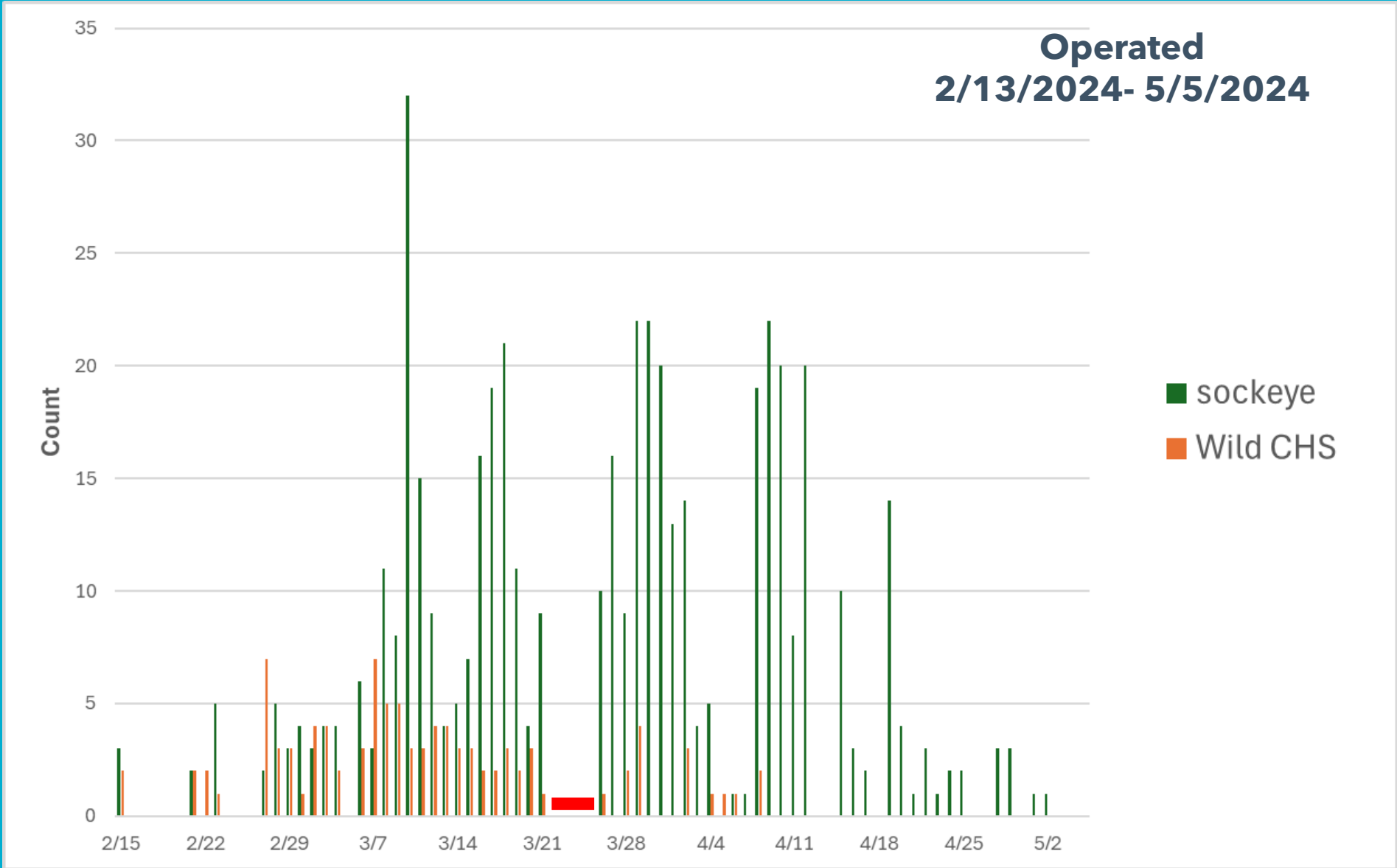
**Objective 2**



# Bull trout and Chinook smolts captured by day



# Sockeye fry and Chinook smolts captured by day



# Historic performance of Monty Trap



Fry released in Metolius by year	Number of smolts tagged at Monty trap	Trap efficiency, based trap recaps
2016 285,500	2017 576	10.80%
2017 108,680	2018 517	13.10%
2018 292,500	2019 0	
2019 232,000	2020 502	11%

**3-Year Trap Efficiency**  
11.60%



# Preliminary estimate of spring Chinook natural production entering Lake Billy Chinook (Metolius River)

## Objective 1

	# Recap	Trap Eff.	Estimated Migrants	Trapping Hours	Potential Trapping Hours	Expanded Migrants
<b>RST Predicted</b>	<b>11</b>	<b>11%</b>	<b>867</b>	<b>1639</b>	<b>1943</b>	<b>1028</b>

Source Carlson et. al. 1998

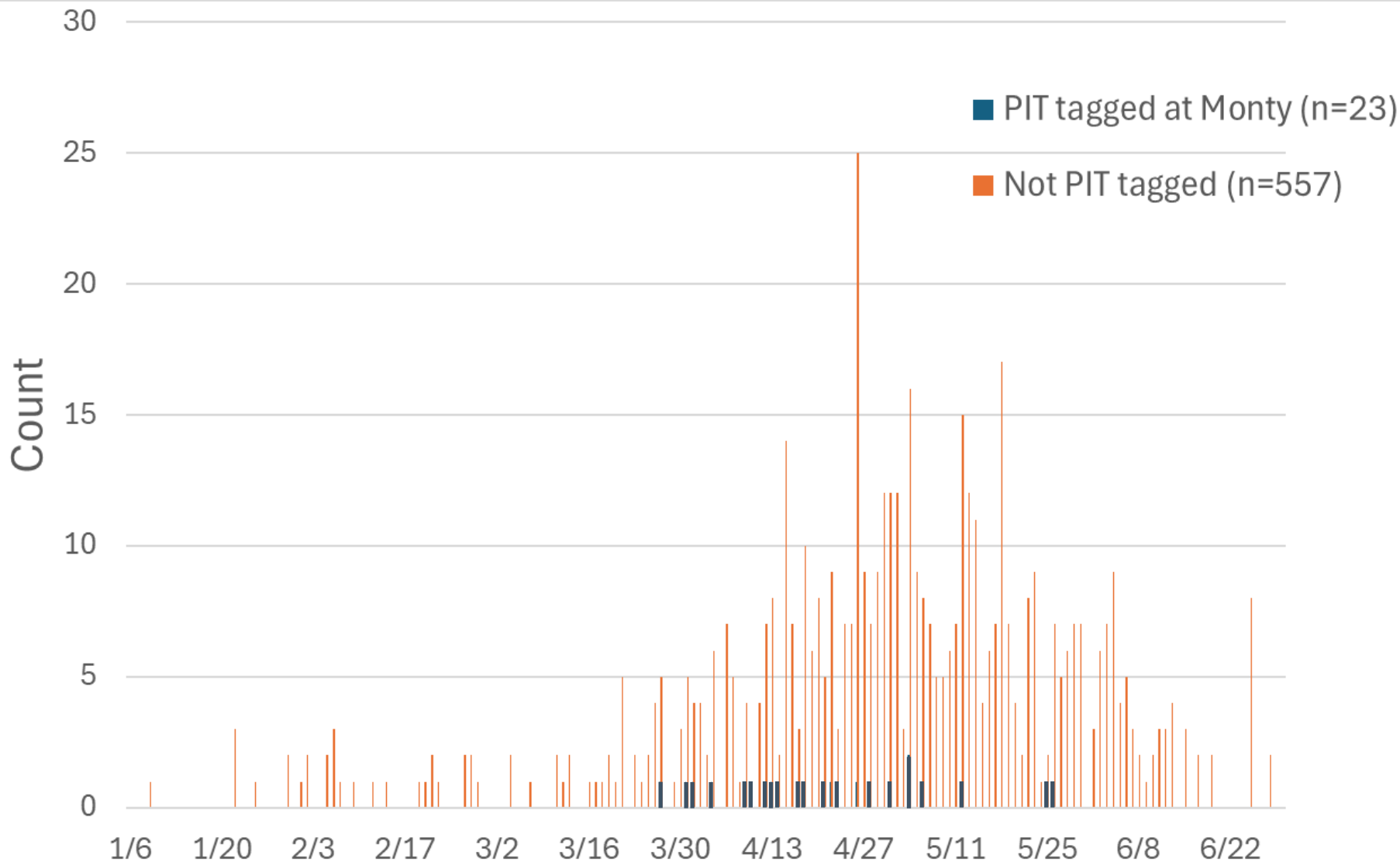


# Percentage of fish entering Lake Billy Chinook successfully captured at the SWW

## Objective 3

Estimated migrants  
**67%**

Expanded migrants  
**57%**



Travel Time	Days
Average	45
Min	15
Max	87
Median	37



# How does our estimate compare to previous results?



Year	Wild Chinook	Naturally reared Chinook	Hatchery reared Chinook	LBC released Chinook
2018		32%		38%
2019				40%
2020		22%	14%	26%
2021			27%	44%
2022			34%	43%
2023				43%
2024	67% (Est.)			38%
2024	57% (Exp.)			



# Questions?

**Thank you!**

Micah Bennett  
Kelli Iddings  
Amber Herman  
Ace Fairchild-Gregory  
Alex de los Rios  
Sarah Ross  
Ayden Roth  
Bree Belardinelli  
PGE Maintenance Crew  
Becky Burchell  
Megan Hill  
Nancy Doran





# Mean daily flow $f^3/s$ at Monty Camp gage for years used to calculate trap efficiency (source USGS)

