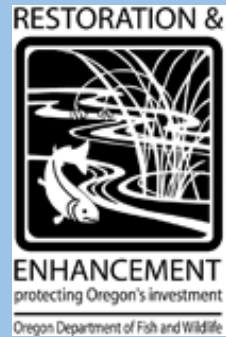


Invasive Chub Removal East, Paulina Lake and Lava Lakes 2010 2022

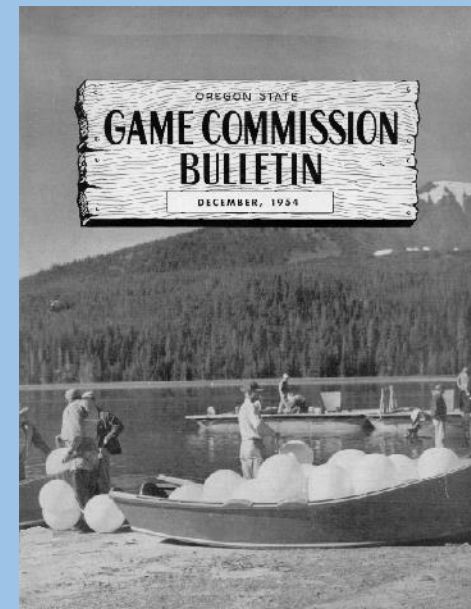


Big Lava Lake
Resort



Upper Deschutes Subbasin Invasive fish and Illegal Introductions

<u>Waterbody</u>	<u>Species</u>	<u>Year</u>
Prineville	Black crappie, brown bullhead	1992
Ochoco	Black crappie, brown bullhead	1996
Walton	Brown bullhead	2000
Antelope Flat	Brown bullhead, goldfish	2004
Crane Prairie	Stickleback, bluegill, crappie largemouth bass, tui chub brown bullhead	1980 – 2003
Davis	Largemouth bass, Tui chub	1995
Big Lava	Tui chub	
Little Lava	Tui chub	
North_South Twin	Brown bullhead	1995
Suttle Lake	Smallmouth Bass	2018
Paulina Lake	Blue Chub	
East Lake	Tui Chub	
Haystack Res	Smallmouth Bass	2004



East & Paulina Lakes, Big Lava Lake

Popular destination trout fishing lakes: resorts, boat rentals, fishing guides,

- Various attempts to control chub from 1947-1980s
- Brown trout, Atlantic salmon, Blackwater Rainbow, Eagle lake Rainbow introduced in East and Paulina to control chub
- Lava Lake treated with rotenone 1980s, trapping chub for 20 years
- East/Paulina 1980s – shoreline rotenone to kill spawning chub, seining

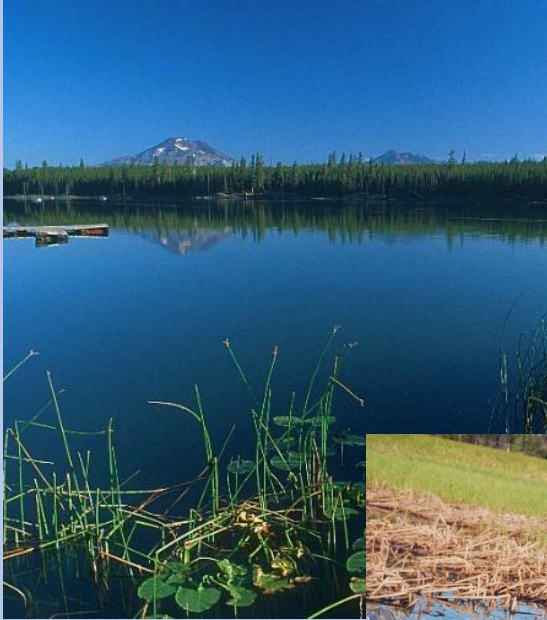


East Lake -



- **2010, 2011:** first attempts to remove chub with trap/fyke nets, ODFW_STEP staff and volunteers
- **2012-2014 :** ODFW biologists and two OSU interns remove chub (R&E grant)
- **2015- 2016:** Ceased chub removal – monitor only
- **2017 -** ODFW biologists and two OSU interns remove chub (R&E)
- **2018:** Ceased chub removal – monitor only
- **2019:** ODFW biologists and two OSU interns remove chub (R&E)
- **2020:** Ceased chub removal – monitor only
- **2021 :** remove chub (R&E)
- **2022:** remove chub (R&E)
- **2023- 2024:** remove chub (R&E)

Lava Lake -



- Rotenone treatments: **1946, 1949, 1963, 1980**
- **1987 to present:** Lava Lake chub removal via trap net by resort owners
- Peak spawn time is mid May
- **2012 -2019:** ODFW assists Lava Lake (provides nets, sets nets, removes nets)
- **2012-2014,2017, 2019, 2021-22** : two OSU interns assist (R&E grant)
- Trap net catches 3,000 to 26,000 pounds annually - removed 15,000 pounds of chub in 2019, 10,000 in 2022

RESTORATION &



ENHANCEMENT

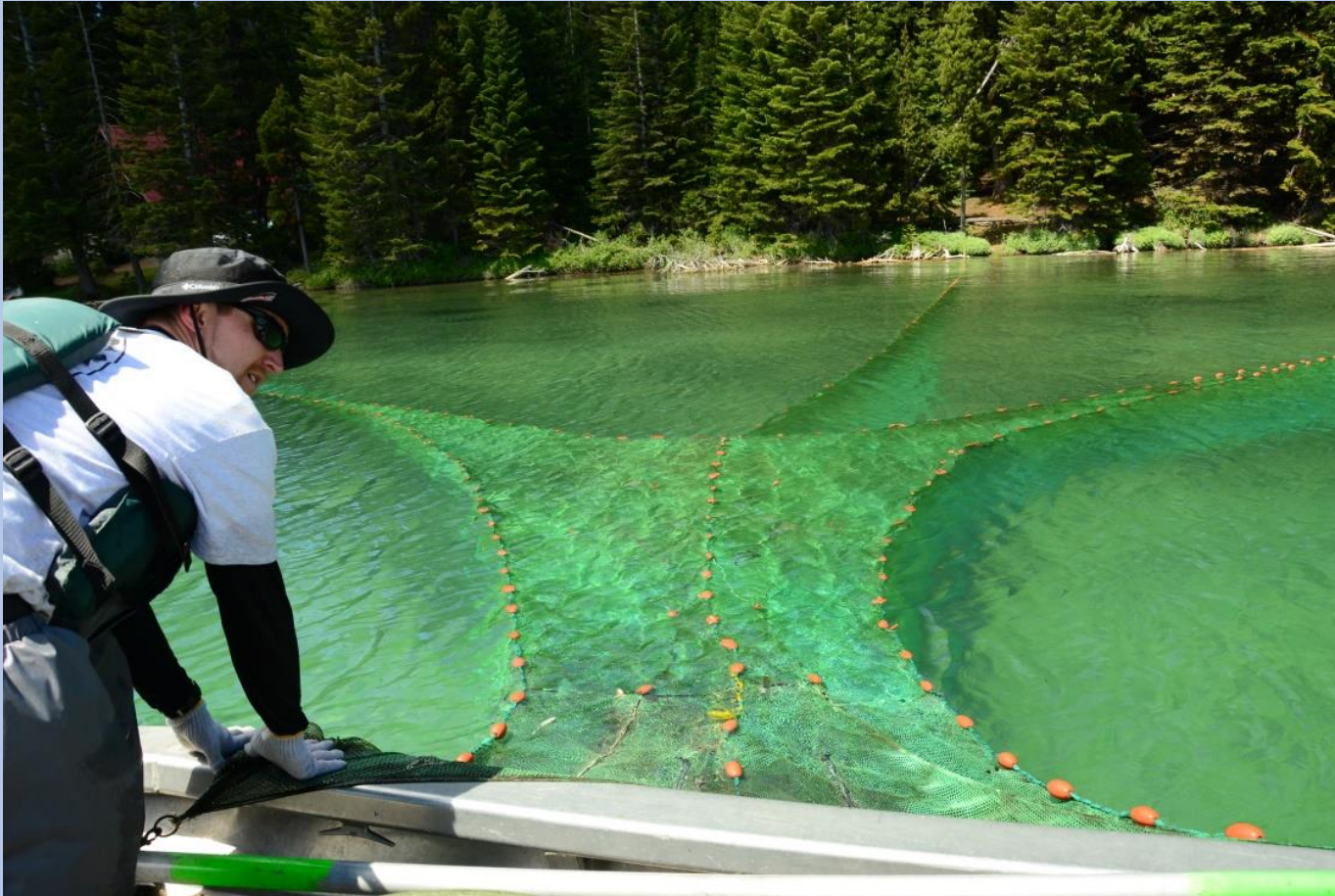
protecting Oregon's investment

Oregon Department of Fish and Wildlife

Funding – 2021 and 2022 Total cost 2 years: \$64,000

- OSU Cascades Internship stipend (\$29,500 R&E grant) includes truck lease
- Sunriver Anglers purchased 1 net (\$1,500) contributed to stipend (\$2000)
- COF contribution to stipend (\$3,000). Since 2010, has contributed at least \$10,000
- Matching STEP -ODFW/OSU: boats, nets, ODFW STEP biologist time, survey gear (\$28,000 – two years)

Set multiple nets in each lake
May-August (July is peak spawn
for East and Paulina), nets are
moved periodically





Chub are caught near shoreline when they congregate and spawn at night.

Nets cost \$1,700 to \$4000 each, depending on size. Bend ODFW has 15 nets. Nets require cleaning and repair each year.





Empty the nets every other day,
work up trout, trout released, very little trout
mortality, otters can be a problem



Barrels of chub from boat to truck, drive to dump site (permit from USFS) – Drive back to Bend – 100 miles each day – can be labor intensive



HOW DO WE KNOW IT IS WORKING?

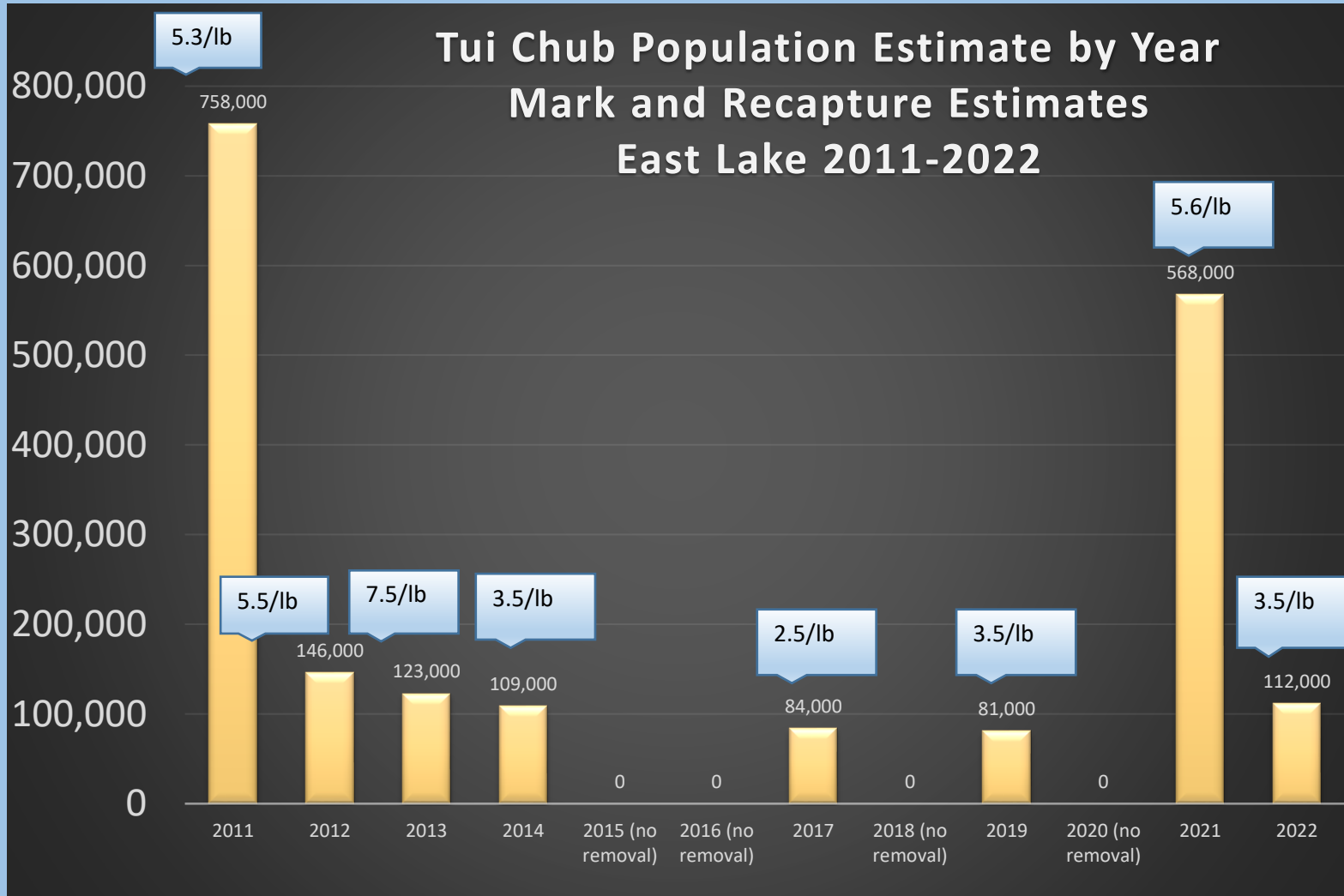
- Angler reports are positive – East and Lava Lake especially. “Catching trout and NOT chub”
- Condition factors, relative weights of trout improve - East Lake
- Fewer chub trapped each year – Population estimate decreases – East Lake
- Paulina Lake – difficult to tell if chub removal is making a difference.



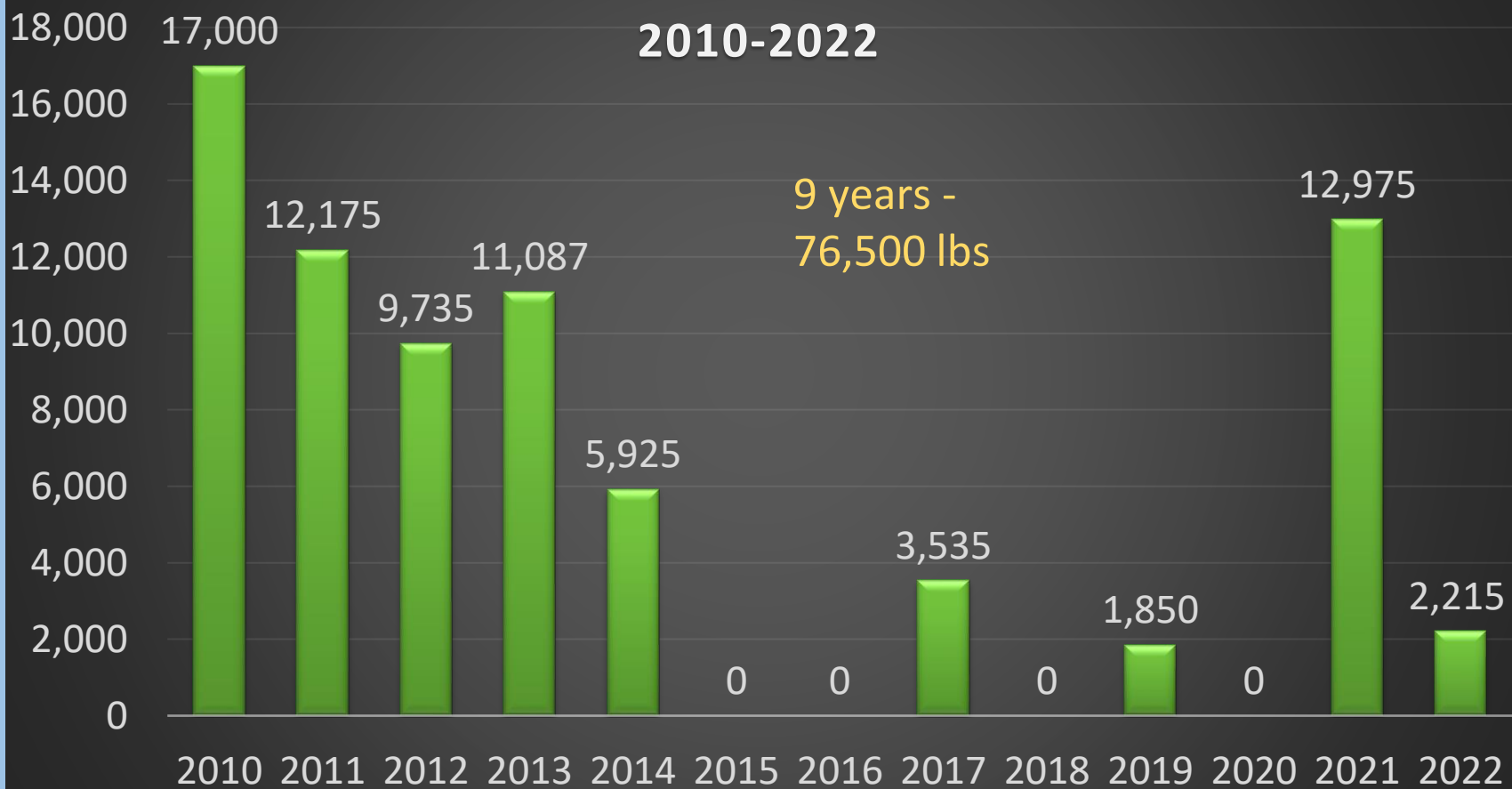
Tui Chub Population Estimate by Year

Mark and Recapture Estimates

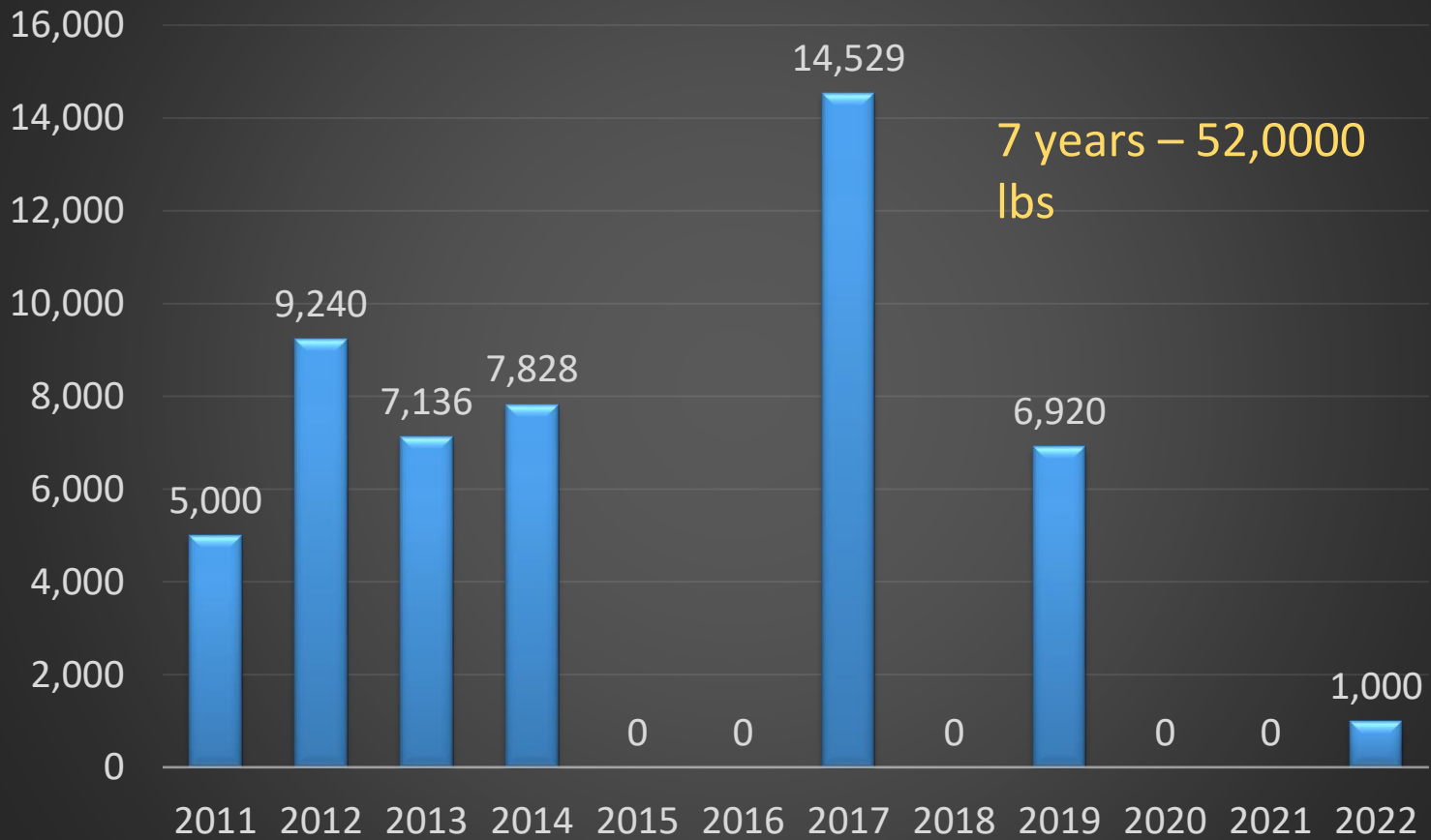
East Lake 2011-2022



Pounds of Chub Removed from East Lake 2010-2022



Pounds of Chub Removed from Paulina Lake 2011-2022



K Value – Condition				
1.4	Excellent, Trophy			
1.2	Good, well proportioned			
0.9-1.0	Fair, acceptable to most anglers			
0.8	Poor, thin fish			
0.7	Extremely poor fish, big head and thin body.			



Ex. 18" and 2 lb = 1.0

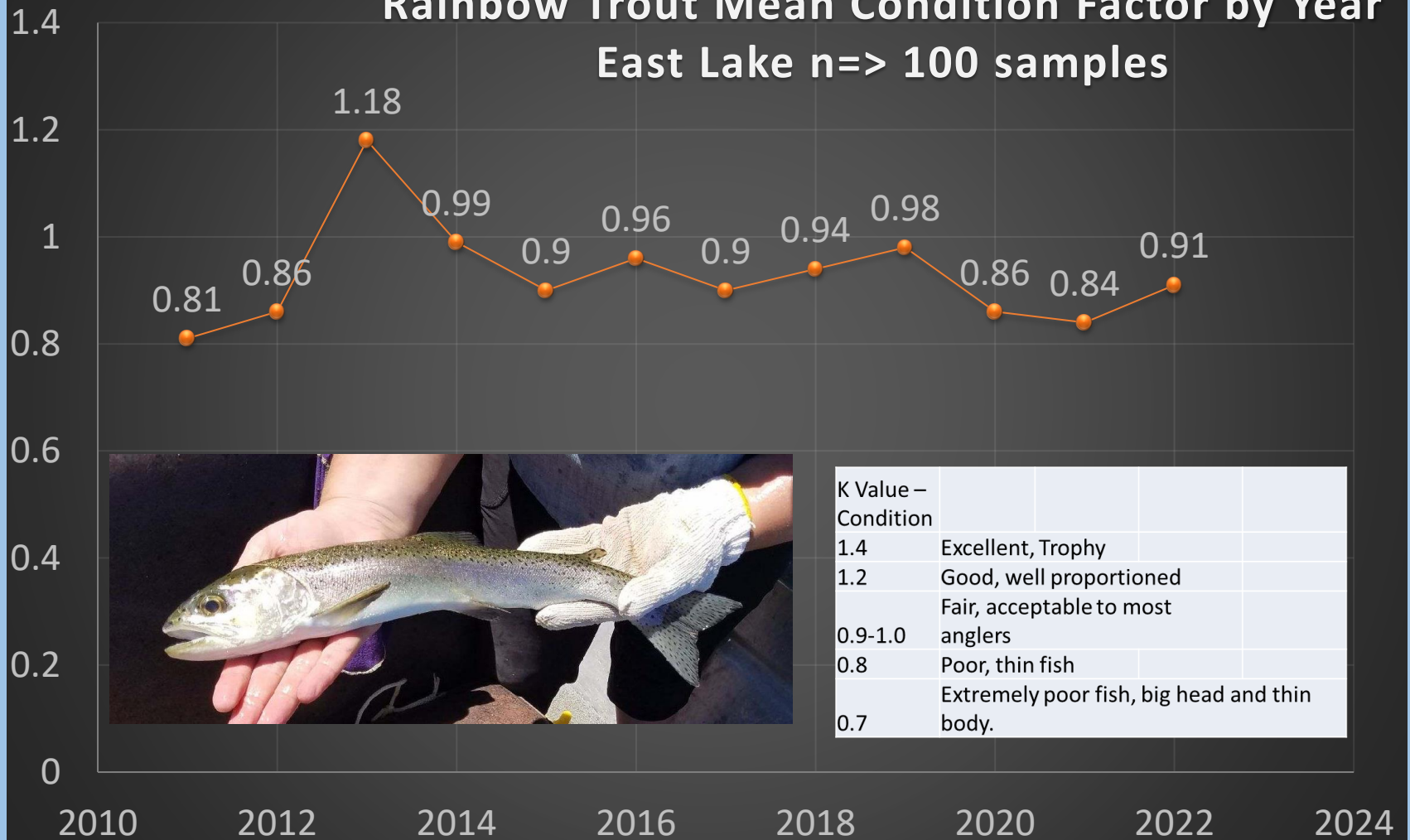


0.7 Extremely Poor Condition



1.0 -1.2 Fair to Good Condition

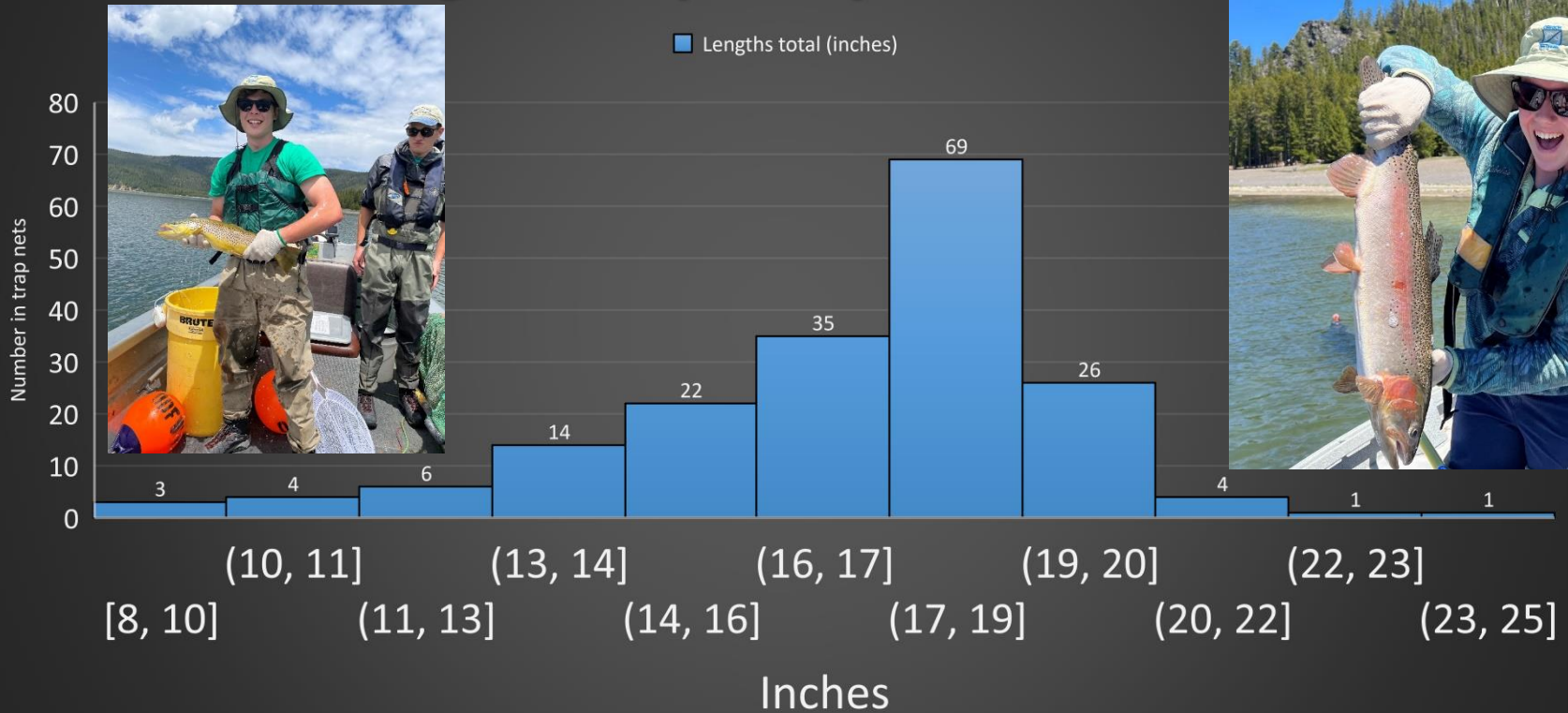
Rainbow Trout Mean Condition Factor by Year East Lake n=> 100 samples



K Value – Condition	
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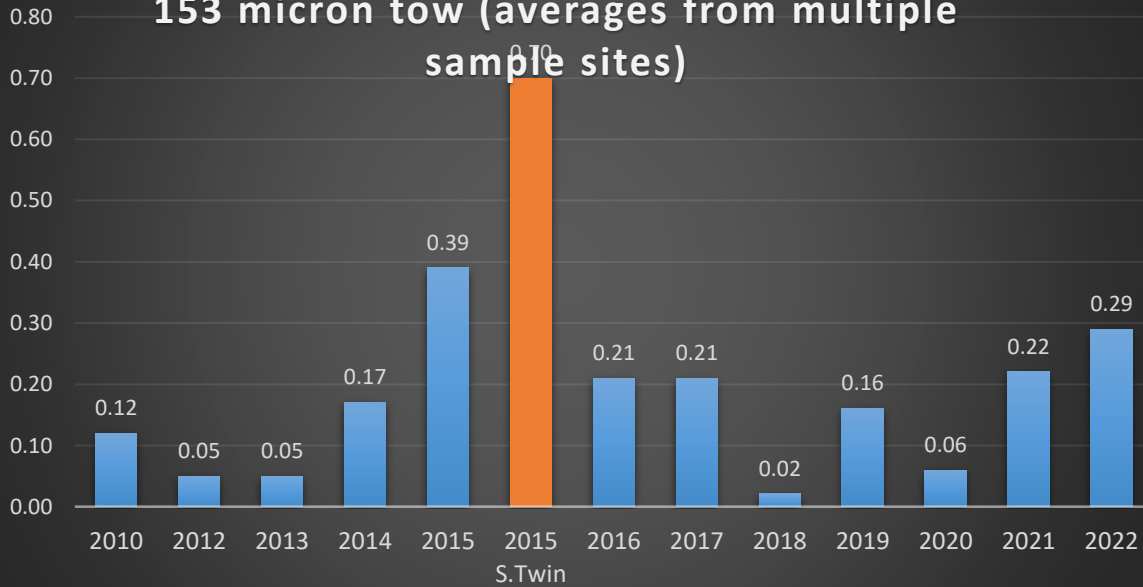
Trout we catch in the trapnets, many in the 17-19" range

Trout Length Frequency - East Lake -2022





East Lake Zooplankton: Grams per meter tow
153 micron tow (averages from multiple
sample sites)



Bullhead Catfish Removal - Crane Prairie

- 2019 – Trapped and removed 10,000 lbs in 3 weeks
- 2021 – 17,510 lbs in 3 weeks
- 2022 – Only 2,800 lbs (mostly juvenile and YOY) in 11 weeks???

