



Michigan State University Extension | National Oceanic and Atmospheric Administration | University of Michigan

Year 4 Kick-off Meeting 2023-2024 Fishing Season

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Michigan Sea Grant
MSU Extension
10/2/2023



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Overview

- Participation over first three years
- Results from Year 3 survey
- Steelhead lengths and what they can tell us about missing 2021 cohort
- Prevalence of unmarked stocked fish
- Percent clipped by watershed and location
- Directions for the future

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Combating Attrition

Angler diary programs can be effective for dispersed, specialized fisheries (Cooke et al. 2000).

Attrition is often noted as a barrier to success (Cooke et al. 2000, Lawson 2015; Ormeland et al. 2022).

Online steelhead diary program was designed based on lessons learned from a pen-and-paper Salmon Ambassadors diary.

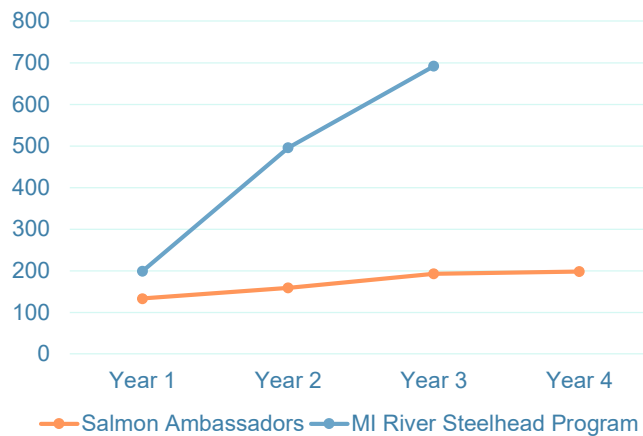


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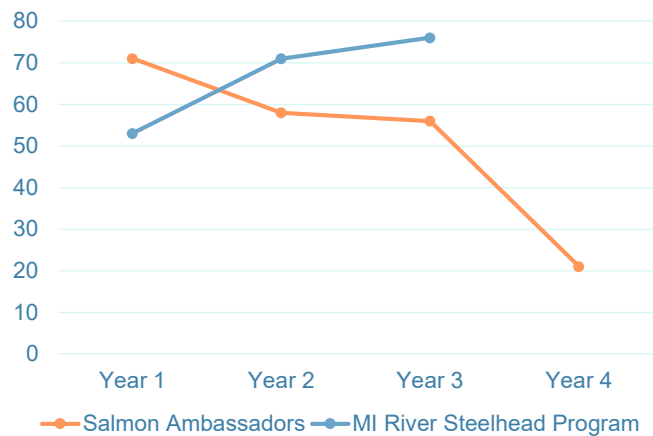


Recruitment and Returns

Volunteer Numbers Assigned Over Time



Complete Catch Data Sets Returned Each Year



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MI River Steelhead Program Participation

	Year 1	Year 2	Year 3
Number of Registrant VNs	199	496	693
Surveys Returned	83	88	143
Complete Steelhead Data Sets	46	65	75
Complete River Trip Data Sets	29	25	51
Complete Lake Trip Data Sets	10	6	4
Steelhead in Complete Data Sets	1,380	2,945	2,702

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Engagement of cohorts

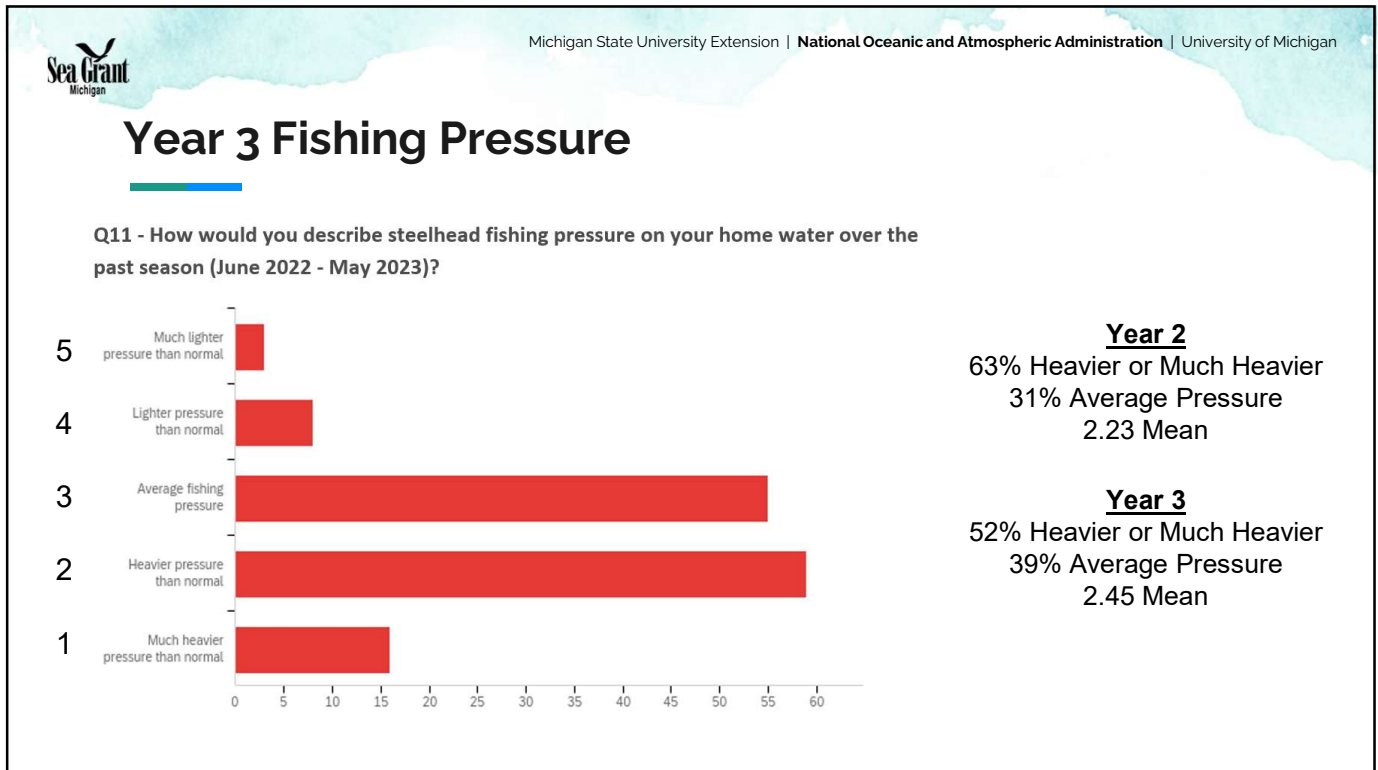
Year 3 Changes

Shorter Survey
Prize Drawing

	Survey Returns		
Year of Registration	Year 1	Year 2	Year 3
Year 1 or earlier	83	39	43
Year 2	0	49	52
Year 3	0	0	48

	Complete Steelhead Catch Data Sets		
Year of Registration	Year 1	Year 2	Year 3
Year 1 or earlier	55	26	26
Year 2	0	45	27
Year 3	0	0	22

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Year 2 Angler Satisfaction

Strongly Disagree ← → Strongly Agree



3.11 Q13 - I was satisfied with my steelhead catch rate on my home water

3.65 Q14 - I was satisfied with my fishing experiences overall

2.97 Q15 - Steelhead fishing was good this year vs. past 5 years on my home water

3.03 Q16 - Steelhead fishing was good this year vs. last year on my home water

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Year 3 Angler Satisfaction

Strongly Disagree ← → Strongly Agree



3.12 Q7 - I was satisfied with my steelhead catch rate on my home water

3.75 Q8 - I was satisfied with my fishing experiences overall

2.73 Q9 - Steelhead fishing was good this year vs. past 5 years on my home water

2.77 Q10 - Steelhead fishing was good this year vs. last year on my home water

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Home Water	N	Q7 - Satisfaction with catch rate on home water.	Q8 - Satisfaction with fishing experience overall.	Q9 - Steelhead fishing relative to past five years on home water.	Q10 - Steelhead fishing relative to last year on home water.	Q11 - Fishing pressure on home water last season.
Erie/St.Clair Tributaries	18	2.06	3.50	2.00	1.89	2.56
Clinton	12	2.17	3.75	1.92	1.92	2.50
Huron	6	1.83	3.00	2.17	1.83	2.67
Lake Huron Tributaries	9	3.44	4.22	2.56	2.78	2.44
AuGres	2	3.50	4.50	2.50	3.50	2.50
AuSable	2	2.50	3.50	2.00	1.50	3.00
Rifle	1	4.00	5.00	4.00	4.00	3.00
Thunder Bay	4	3.75	4.25	2.50	2.75	2.00
Lake Michigan Tributaries	105	3.31	3.75	2.90	2.92	2.43
Betsie	6	2.67	3.67	2.50	2.67	2.50
Boardman	1	1.00	3.00	1.00	2.00	2.00
Boyne	1	4.00	4.00	5.00	4.00	2.00
Grand	21	2.80	3.55	2.55	2.75	2.74
Kalamazoo	4	3.75	3.75	2.50	2.25	2.75
Manistee	26	3.38	3.62	2.96	3.00	2.19
Muskegon	11	3.36	3.73	3.18	3.45	2.00
Pere Marquette	18	3.89	4.17	3.17	3.00	2.33
St. Joseph	8	3.25	3.88	3.00	2.88	2.63
White	9	3.44	3.78	3.00	2.78	2.89
Lake Superior Tributaries	2	3.50	4.00	2.50	3.50	2.00
Sucker	1	4.00	4.00	4.00	5.00	3.00
Various Watersheds	1	3.00	4.00	1.00	2.00	1.00
Big Lake - Lk. Michigan	5	2.40	3.80	2.00	2.40	2.60
Big Lake - Lk. Huron	2	3.00	4.00	2.00	2.00	3.50
Out of State Streams	2	3.00	3.50	3.50	3.50	2.00
Grand Total	143	3.12	3.75	2.73	2.77	2.45

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Steelhead Life History

- Parr – stream phase juvenile, 1 to 3 years
- Smolt – fish turn silver and move downstream
- Lake Phase – spend 1 to 6 summers in Great Lakes
- Stream Phase – adults first spawn after 1 to 4 summers in lake, many repeat spawners
- “Stream Age” – Number of years before smolting
- “Lake Age” – Number of summers spent feeding in Great Lakes
- Stream age before decimal, lake age after => Age 1.3

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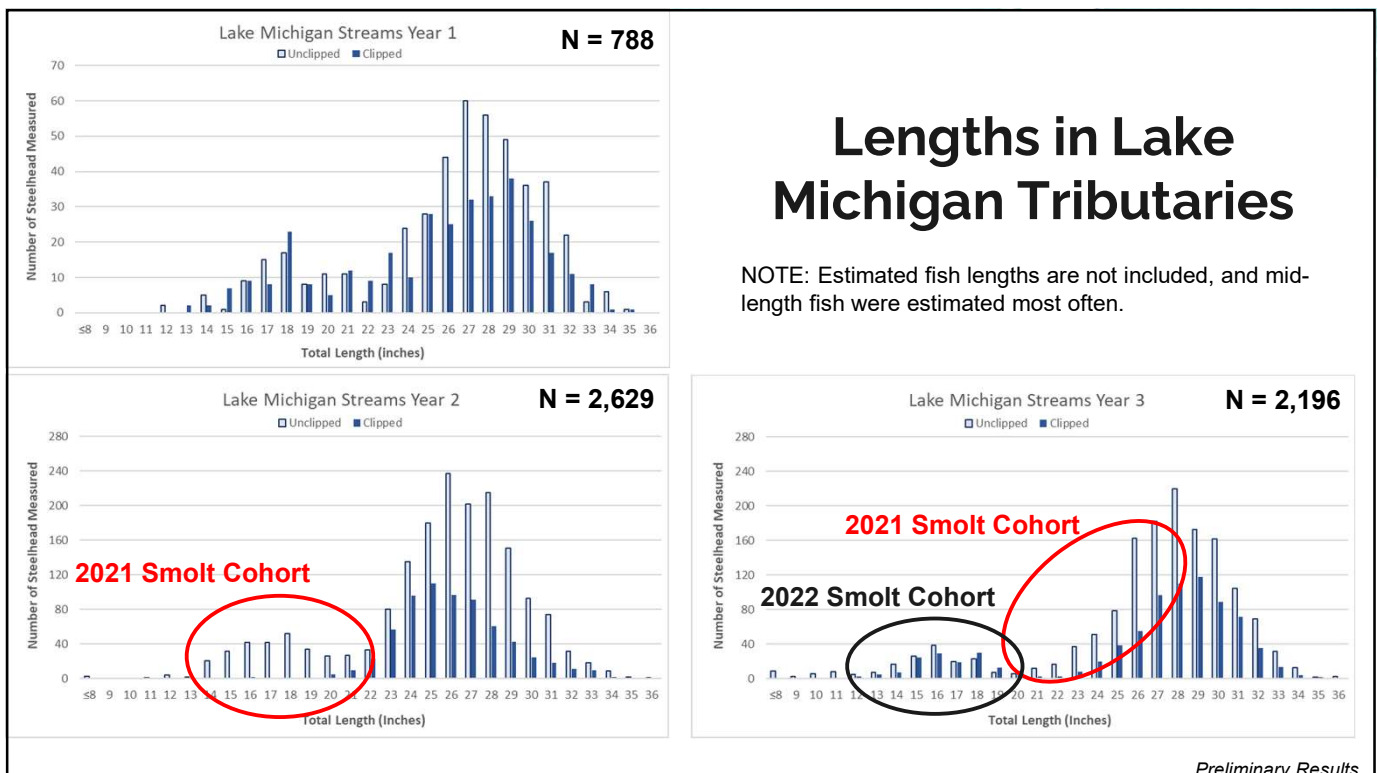


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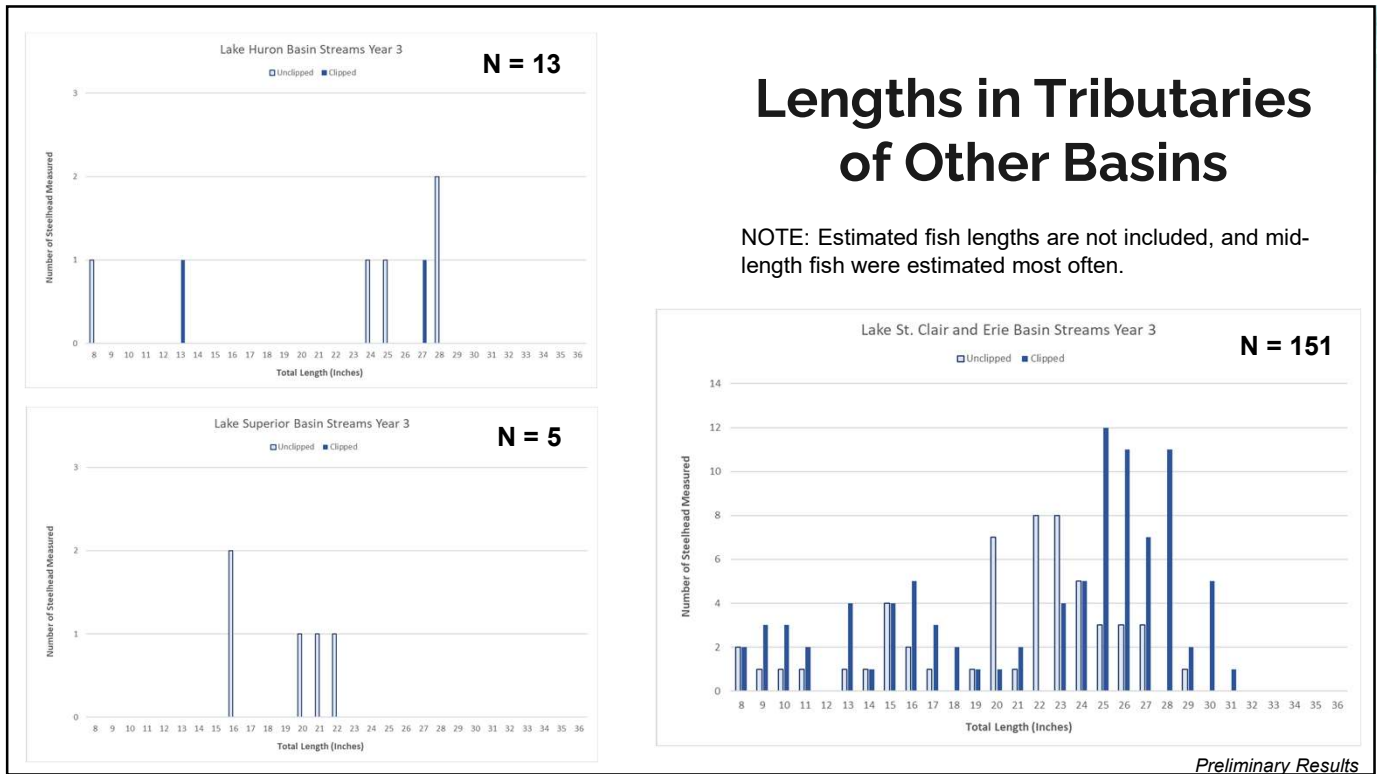
Clipped Smolt Cohorts

Yearling Stocking Cohort	Fall 2018 Spring 2019	Fall 2019 Spring 2020	Fall 2020 Spring 2021 YEAR 1	Fall 2021 Spring 2022 YEAR 2	Fall 2022 Spring 2023 YEAR 3	Fall 2023 Spring 2024 YEAR 4	Fall 2024 Spring 2025 YEAR 5	Fall 2025 Spring 2026 YEAR 6
2018	1.1	1.2	1.3	1.4	1.5	1.6	AGED OUT	AGED OUT
2019	-	1.1	1.2	1.3	1.4	1.5	1.6	AGED OUT
2020	-	-	1.1	1.2	1.3	1.4	1.5	1.6
2021	-	-	-	MISSING	MISSING	MISSING	MISSING	MISSING
2022	-	-	-	-	1.1	1.2	1.3	1.4
2023	-	-	-	-	-	1.1	1.2	1.3
2024	-	-	-	-	-	-	1.1	1.2

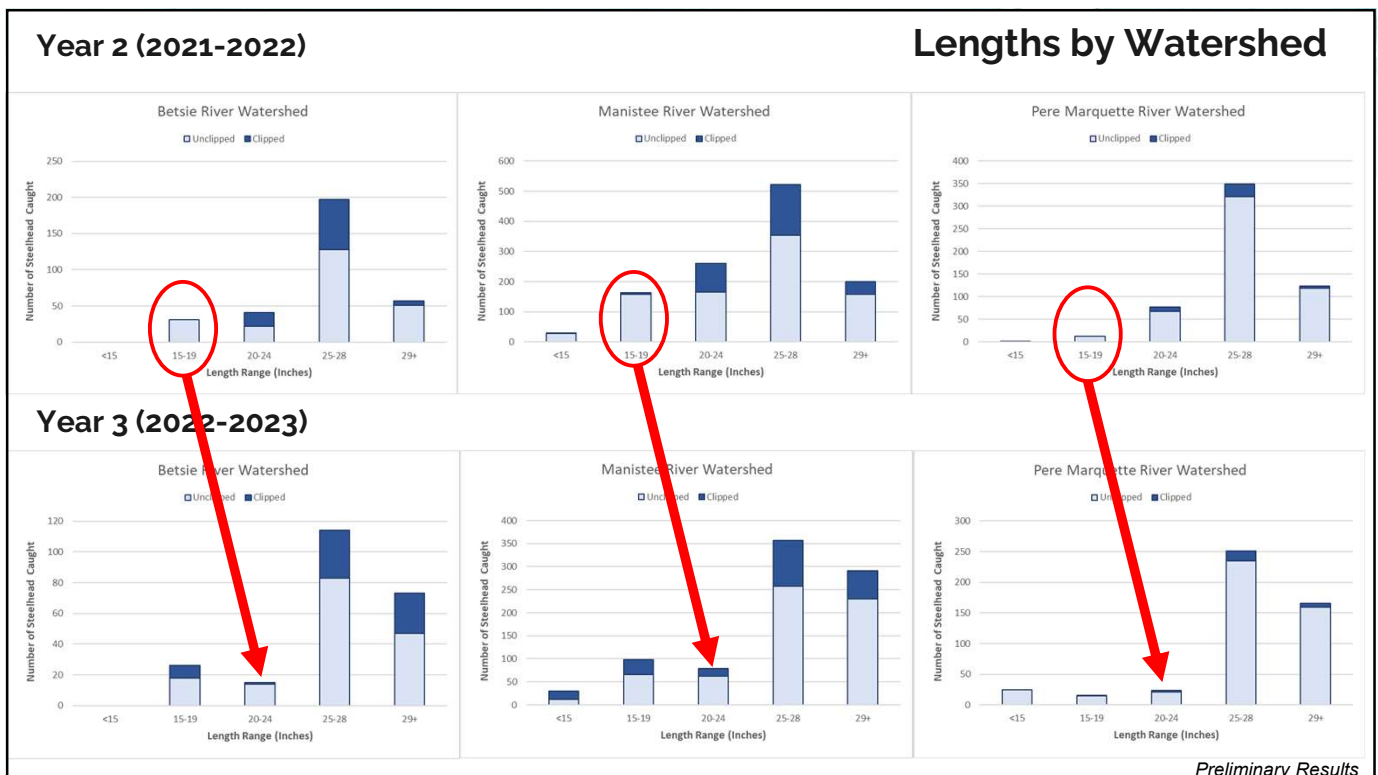
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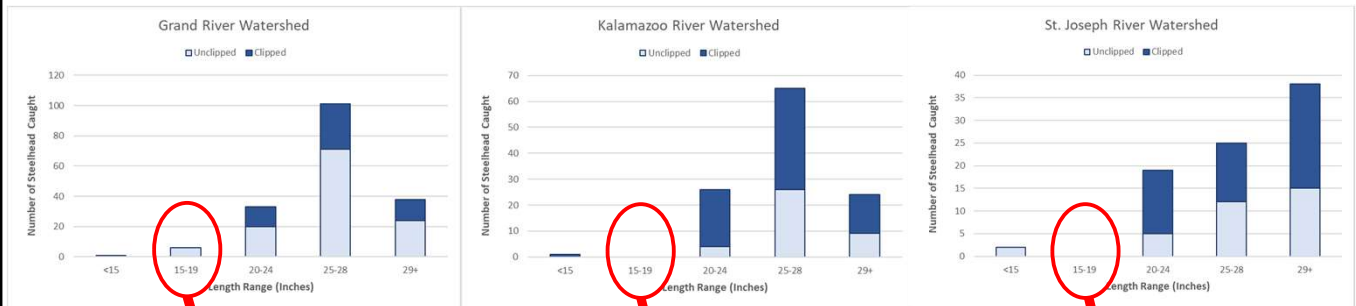


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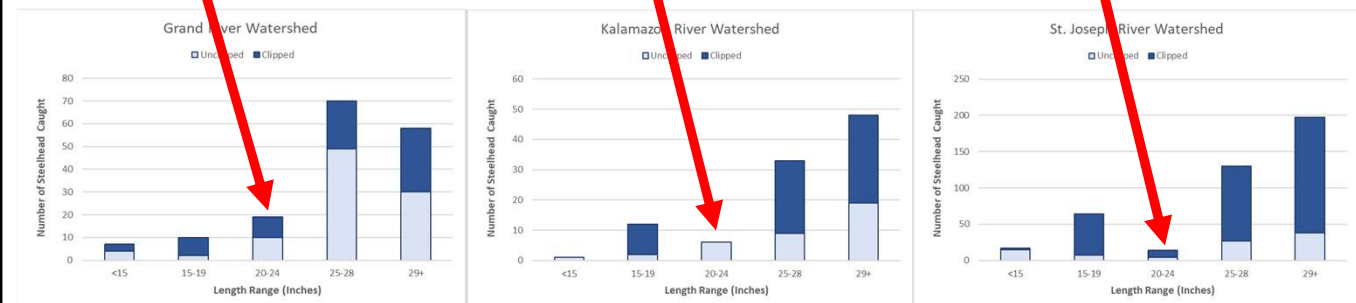


Year 2 (2021-2022)

Lengths by Watershed



Year 3 (2022-2023)

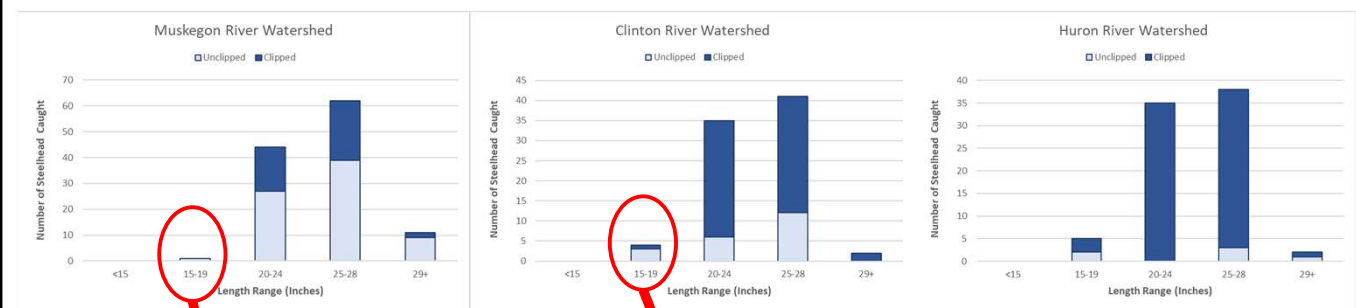


Preliminary Results

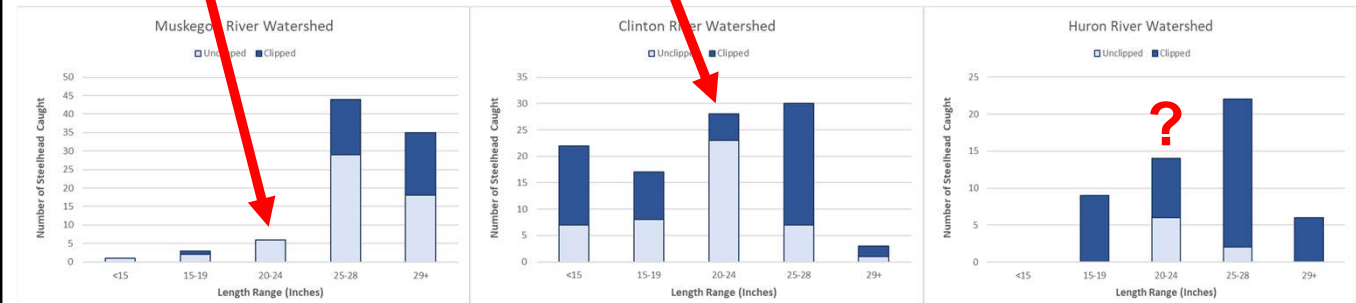
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Year 2 (2021-2022)

Lengths by Watershed



Year 3 (2022-2023)



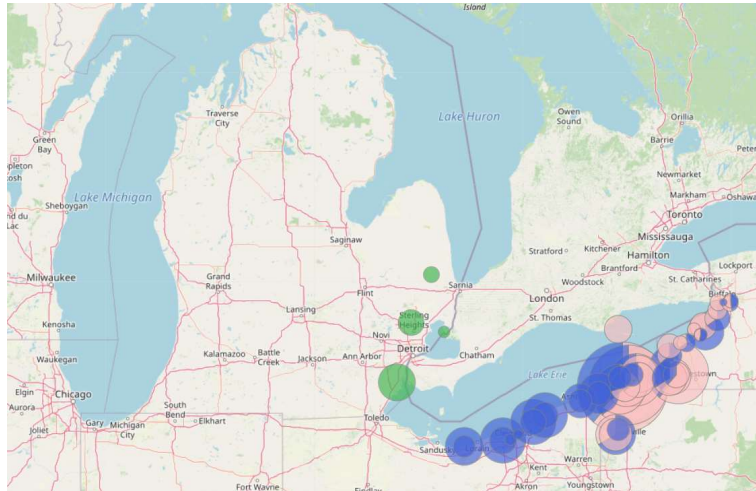
Preliminary Results

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Erie and St. Clair steelhead yearling equivalents stocked

2018-2021 – All Jurisdictions

Budnik et al. 2017
>50% of Huron R.
steelhead from out-
of-state



1.7 million yearling
equivalent steelhead
stocked out-of-state
in Erie Basin in 2021

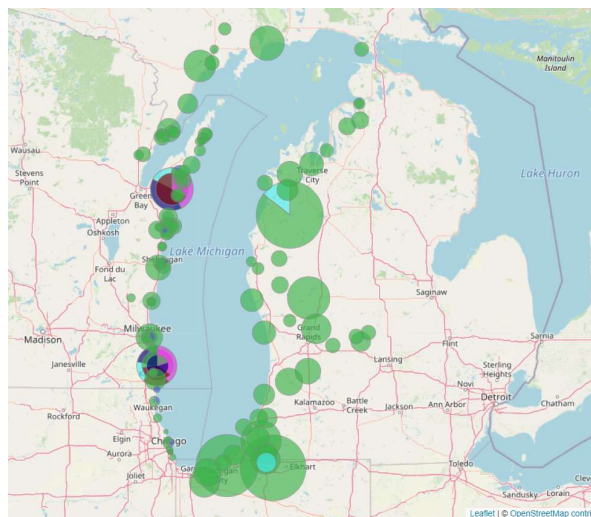
All green (AD) in MI; blue (no clip) or pink (unknown) elsewhere.

Source: Great Lakes Stocking Database (GLFC)

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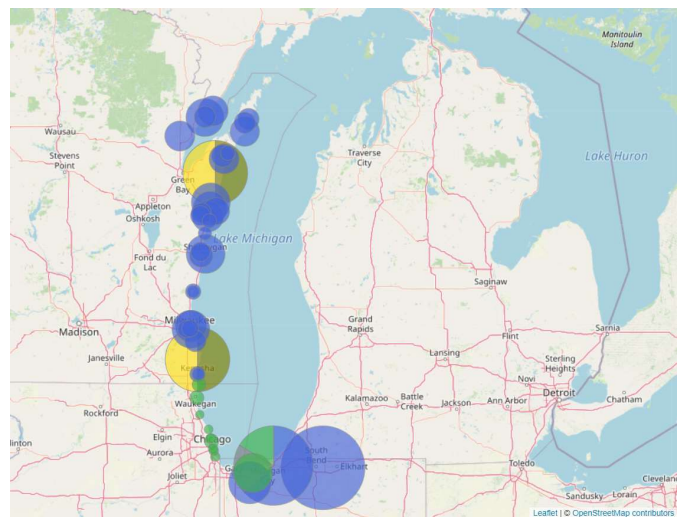
Lake Michigan steelhead yearling equivalents stocked

2018-2020 – All States



All green (AD) or teal (ADLV) on east shore.

2021 – WI, IN, IL



Mostly blue (no clip).

Source: Great Lakes Stocking Database (GLFC)

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Prevalence of unmarked steelhead stocked 2018-2021

Lake Michigan – 10% stocked without marks; mostly in 2021 and all in other states

Lake Huron – 3% of yearlings and 100% of fingerlings and fry unmarked; most from Ontario and 2021 Eagle Lake rainbow yearlings stocked in MI

Lake Erie/St.Clair – Around 95% of yearling equivalents stocked unmarked; all out-of-state

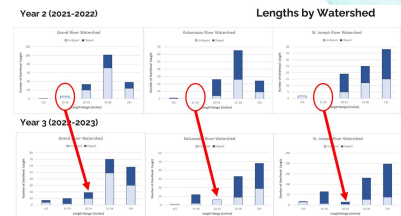
Lake Superior – All yearlings are marked, but unmarked fingerlings are stocked by MI

From Great Lakes Stocking Database (GLFC), summarized in Appendix B of report

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Length-frequency of Unclipped and Clipped to Age-frequency of Wild and Stocked



Convert lengths to ages; could use Great Lakes or river steelhead

Adjust clipped vs. unclipped fish to better reflect stocked vs. wild

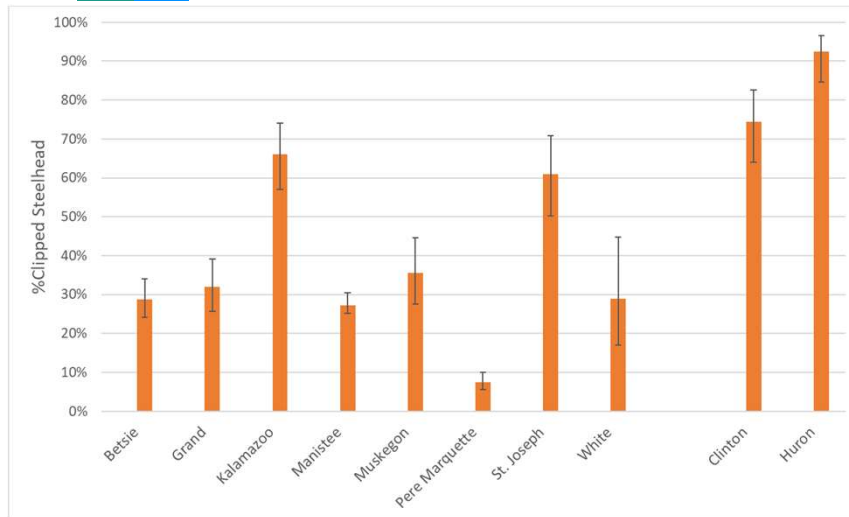
- Adjust for unclipped stocked age groups (age .6 in Year 3, ages .5 and .6 in Year 2, etc.)
- Address straying of unclipped fish from other states (CWT returns?)
- Address straying of wild and stocked fish within Michigan waters

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% Clipped Steelhead by Watershed Year 2



	# of Steelhead	% Clipped
Betsie	326	29%
Grand	178	32%
Kalamazoo	115	66%
Manistee	1146	27%
Muskegon	118	36%
PM	563	7%
St. Joseph	82	61%
White	38	29%
Clinton	82	74%
Huron	80	93%

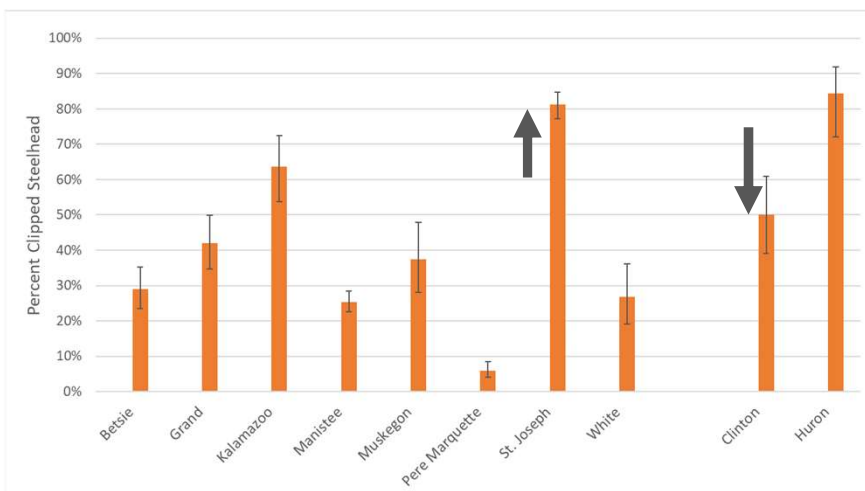
95% Confidence interval shown by error bars; excluding fish under 15 inches long

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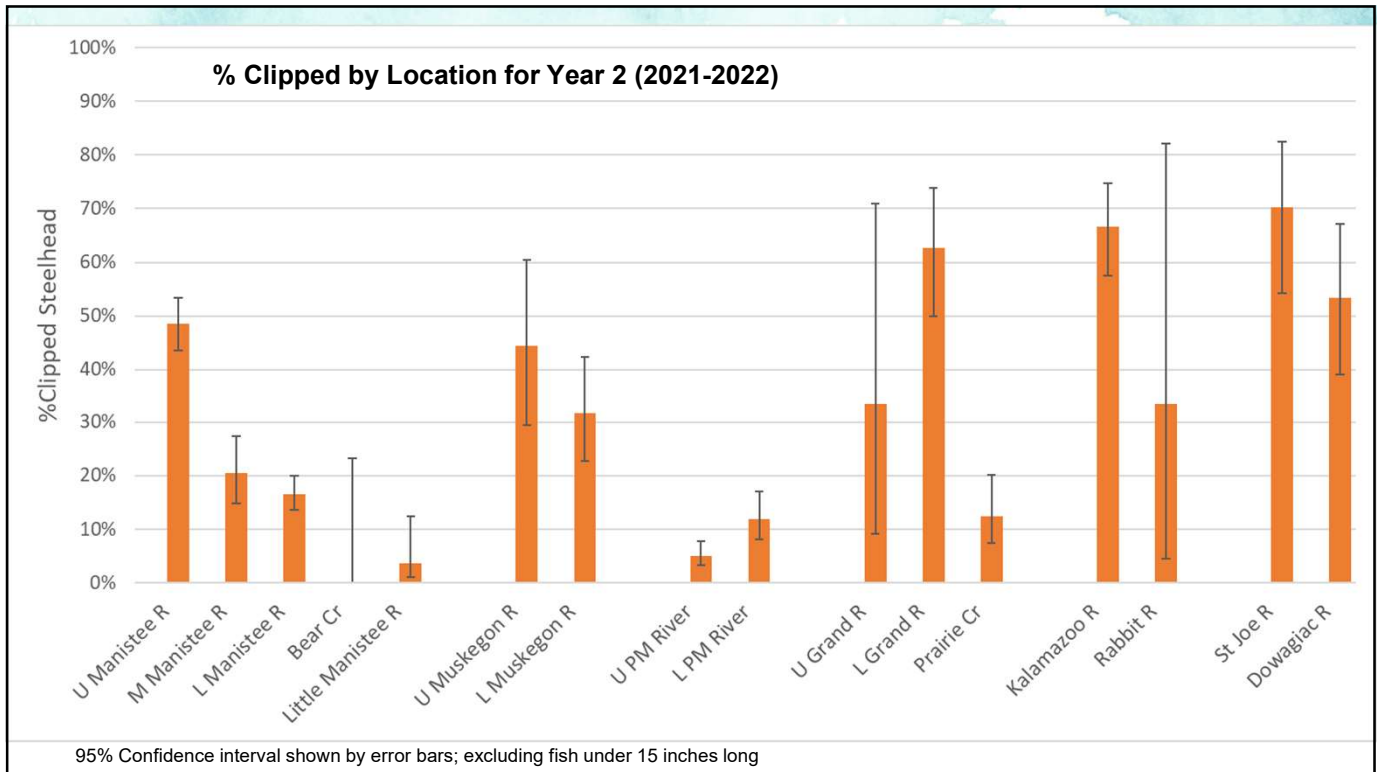
% Clipped Steelhead by Watershed Year 3



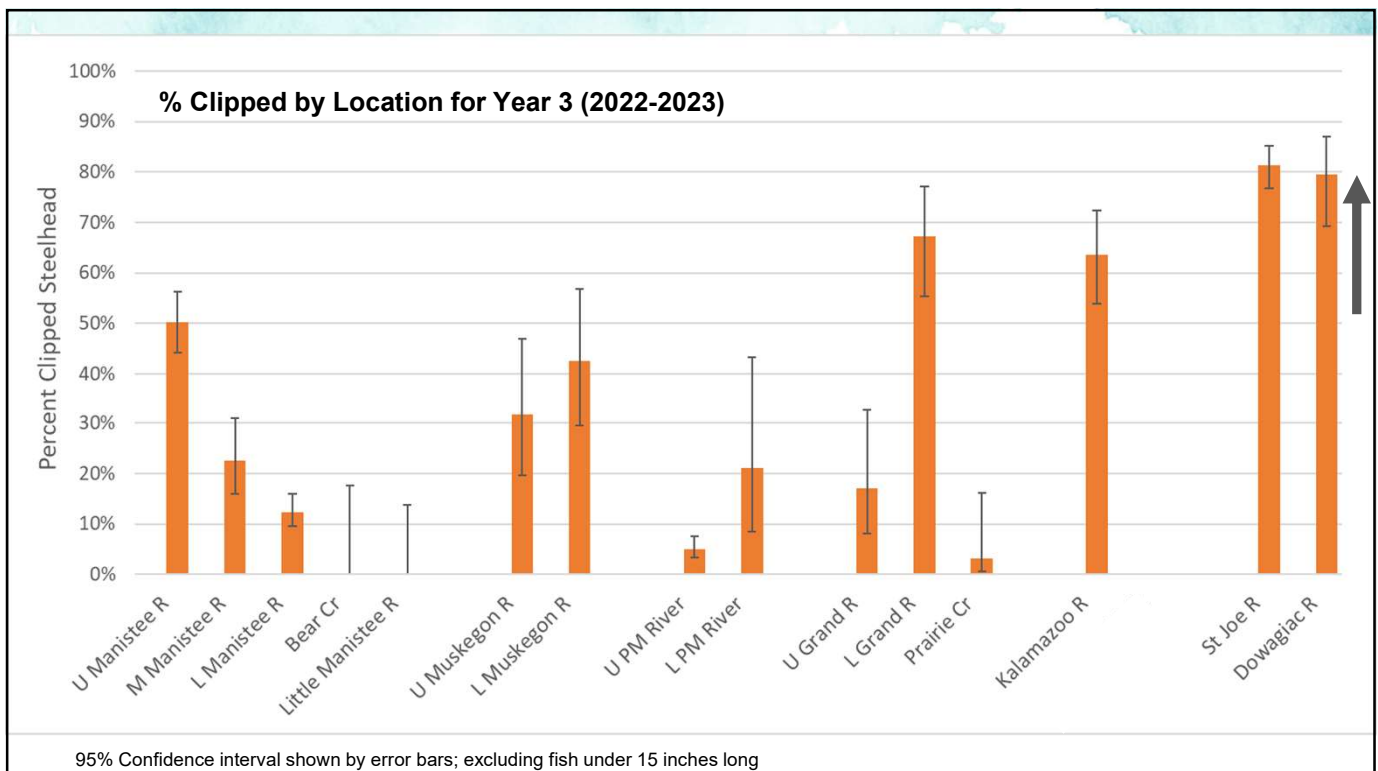
	# of Steelhead	% Clipped
Betsie	228	29%
Grand	157	42%
Kalamazoo	99	64%
Manistee	825	25%
Muskegon	88	38%
PM	457	6%
St. Joseph	405	81%
White	101	27%
Clinton	78	50%
Huron	51	84%

95% Confidence interval shown by error bars; excluding fish under 15 inches long

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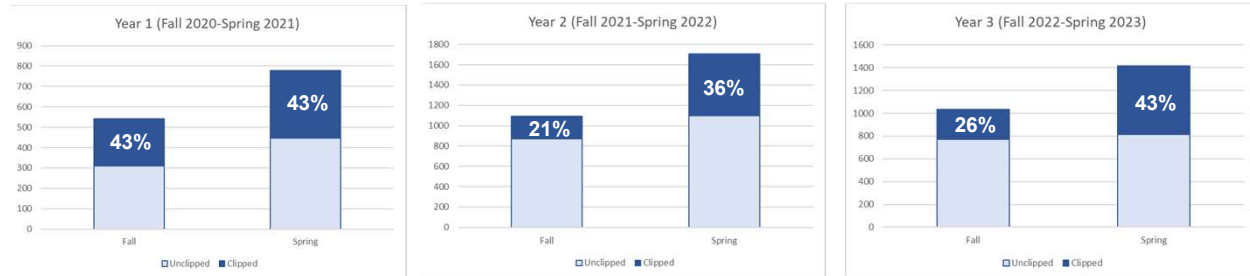
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Steelhead caught in Fall vs. Spring, all basins



264 Clipped fish caught in Fall 2022
604 Clipped fish caught in Spring 2023

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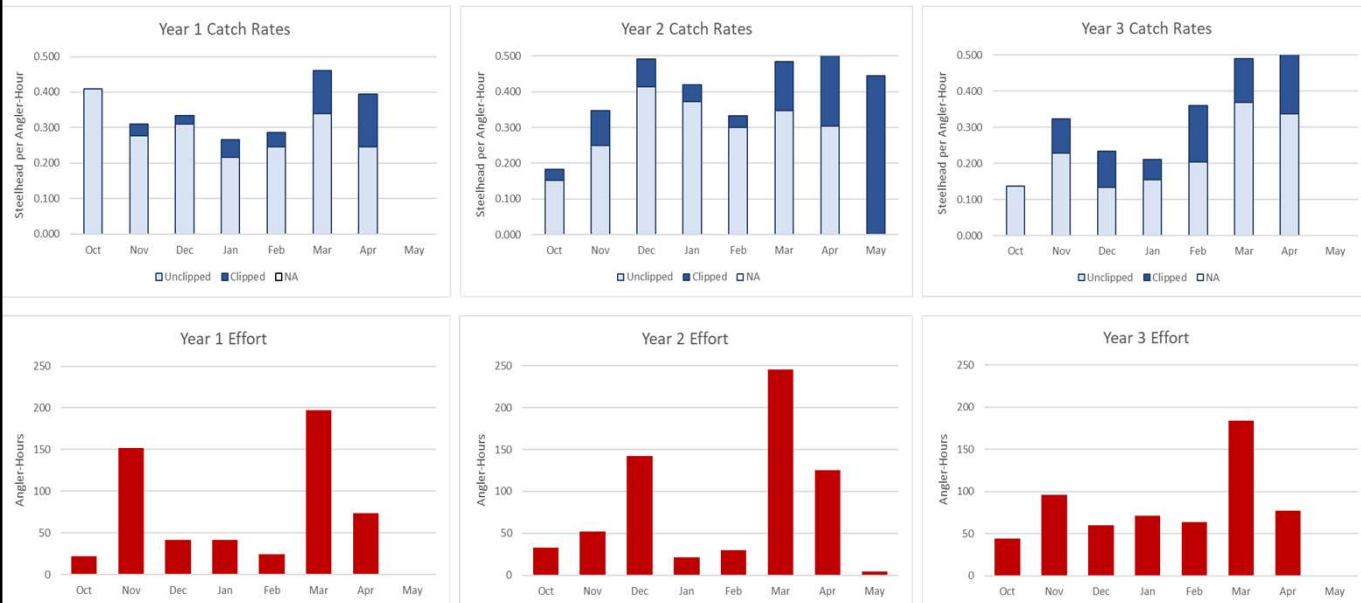
CPUE and Effort by Month for Lake Michigan Tributaries



Preliminary Results

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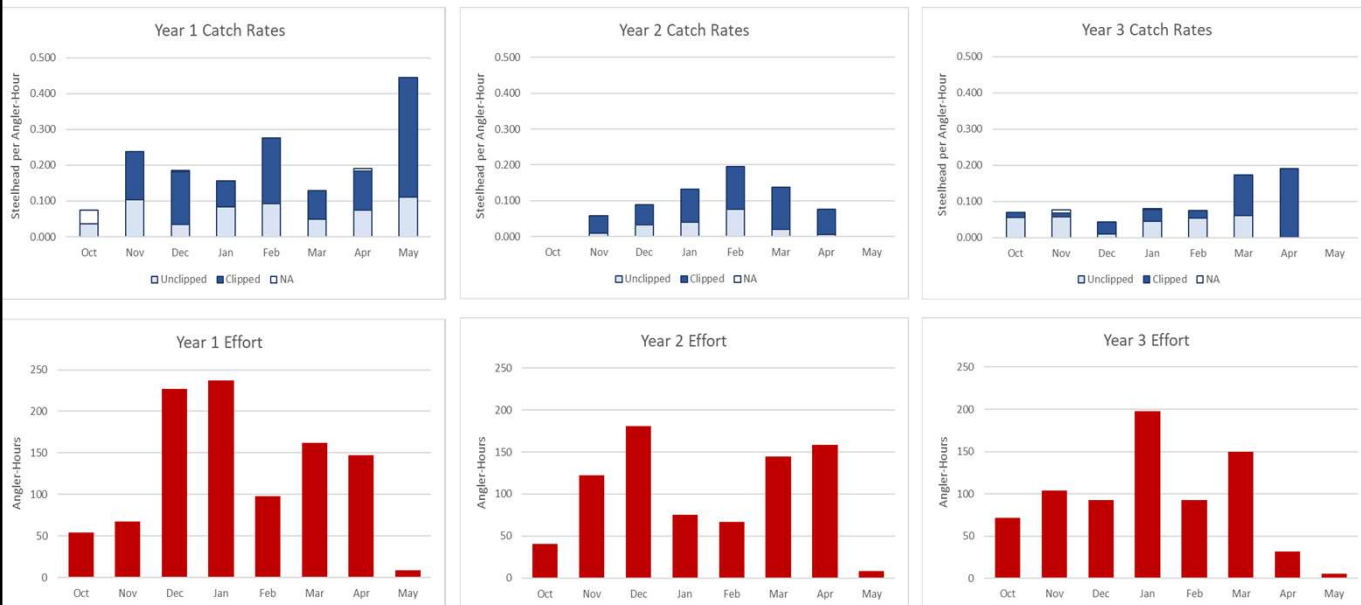
CPUE and Effort by Month for Betsie River



Preliminary Results

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CPUE and Effort by Month for Clinton River

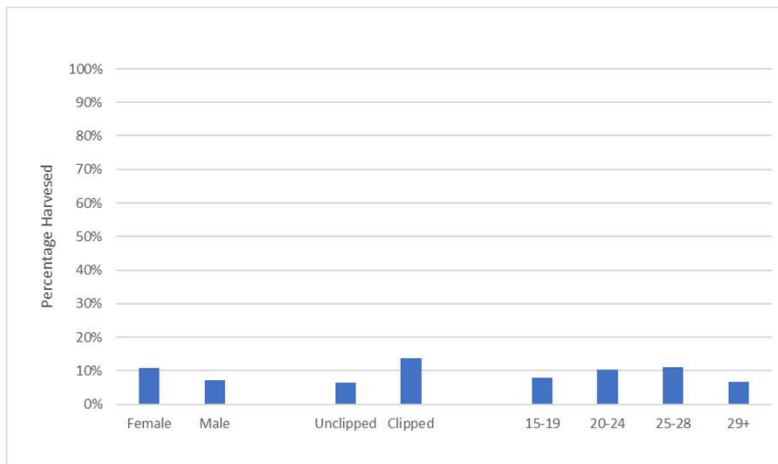


Preliminary Results

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Selective harvest of steelhead

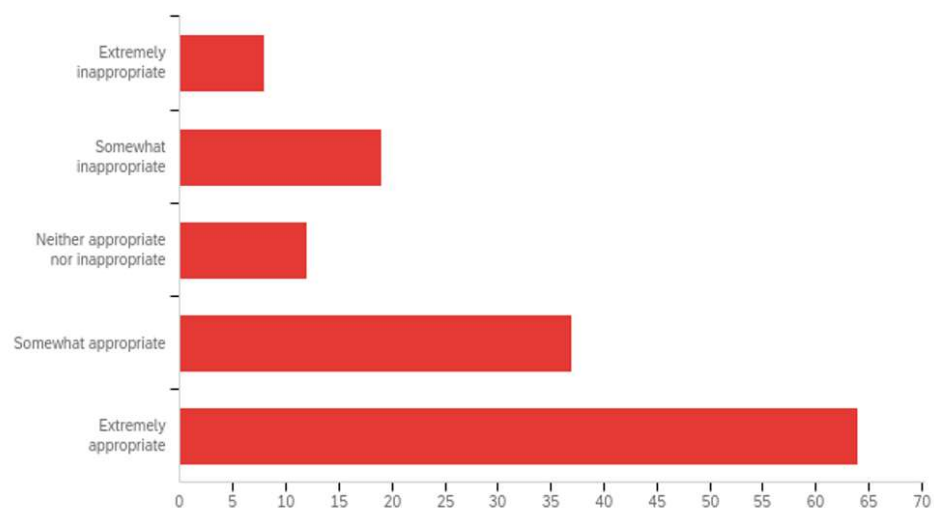


NOTE: Data shown for river steelhead >15" caught during Year 3 (Fall 2022 and Spring 2023).
N = 2,574; 9% harvested

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Q19 - The next four questions reference a recent reduction in the steelhead harvest limit from three to one fish per day on select waters March 15 - May 15 (click [here](#) for full details). Are the new steelhead harvest limit regulations appropriate?



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Q19 – Are the new steelhead limits appropriate?

Stream Expertise	N	Extremely Inappropriate 1	Somewhat Inappropriate 2	Neither 3	Somewhat Appropriate 4	Extremely Appropriate 5	Average	% Extremely or Somewhat Inappropriate
Expert	20	1	6		5	8	3.65	35%
Advanced	67	4	9	7	18	29	3.88	19%
Intermediate	33	1	2	3	9	18	4.24	9%
Novice	5	1	1		1	2	3.40	40%
NA - Lake	4				1	3	4.75	0%
Grand Total	129	7	18	10	34	60	3.95	19%

Q18 – My preferred steelhead harvest limit for most streams in Michigan is...

Stream Expertise	N	Preferred Steelhead Limit in Most Michigan Streams					Average	% Preferring 3 or 5 Steelhead Limit
		0	1	2	3	5		
Expert	20	4	13	2	1		1.0	5%
Advanced	64	11	33	13	7		1.3	11%
Intermediate	32	8	14	4	6		1.3	19%
Novice	4		1		1	2	3.5	75%
NA - Lake	3		1		2		2.3	67%
Grand Total	123	23	62	19	17	2	1.3	15%

NOTE: Data are from Year 3 survey conducted in 2023; agency personnel excluded from results

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Stream Expertise	N	Preferred Steelhead Limit in Most Michigan Streams					Average	% Preferring 3 or 5 Steelhead Limit
		0	1	2	3	5		
Active River Guide	21	4	16	1	0	0	0.9	0%
Recreational River Angler (Int, Adv, Exp)	95	19	44	18	14	0	1.3	15%
Rec. River Angler (Novice)	4	0	1	0	1	2	3.5	75%
NA - Lake	3	0	1	0	2	0	2.3	67%
Grand Total	120	23	61	19	15	2	1.3	14%

NOTE: Data are from Year 3 survey conducted in 2023; agency personnel excluded from results

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Additional information...

DNR presentation at September 14 NRC meeting

Predator Diet Study results from Lake Michigan 2015-2021 (Brian Roth, MSU)

- Steelhead ration increasing
- Proportion of empty steelhead stomachs decreasing
- Steelhead diet diversity increasing


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What Next?

- Improve understanding of how our participants differ from statewide sample (Dec 11 call)
- Calculate catch rates that are comparable from year to year (Dec 11 call)
- Age assignment using steelhead caught in Lake Michigan (May 20 call)
- Scale collection pilot program on Manistee and Betsie
- Loyalty Rewards \$20 gift cards if you record complete data in consecutive years
- Continue with \$50 gift card drawing; must collect complete data and take survey

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**MICHIGAN'S
STEELHEAD
FISHERY NEEDS
YOUR HELP!**



REGISTER at GLanglerdiary.org
RECORD all steelhead fishing trips
MEASURE every steelhead caught
CHECK for fin clips

Full instructions, previous results,
and more info at:
MichiganSeaGrant.org/GLAD

THE FUTURE IS IN YOUR HANDS!

Record complete data, take our June survey, and you will be entered in a drawing to **win a \$50 gift certificate!**
 We never ask for specific holes, only the river you fish!


Michigan River Steelhead Program

Did you ever wonder if steelhead in your favorite river are mostly stocked or mostly wild?

Now you can contribute catch info to Michigan Sea Grant to help us find out. All you need to do is

- **REGISTER** at GLanglerdiary.org or download the GL Angler Diary app for **iOS** or **Android**

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Pending Changes to Apps


- **Delay trip deletion:** iOS and Android apps will not clear from home screen until August 2024
- **“Other” multiple fin clips:** iOS and Android pop-up
- **Adipose/Dorsal clip combo:** New Fin Clip option ADD
- *Dorsal clips are not currently used for steelhead*

No Service 12:47 PM 98%


Back Great Lakes Angler Diary

Trip Date	01/23/2023	📅	
Location	Upper Grand R		
Hours Fished	2		
Anglers in Party	2		
Satisfaction	6 - Slightly Satisfied		
Add			

Species	Length	Fate	Sex	FinClip
STL	25.75	R	M	NO
STL	28.25	R	M	AD



Dan O Keefe




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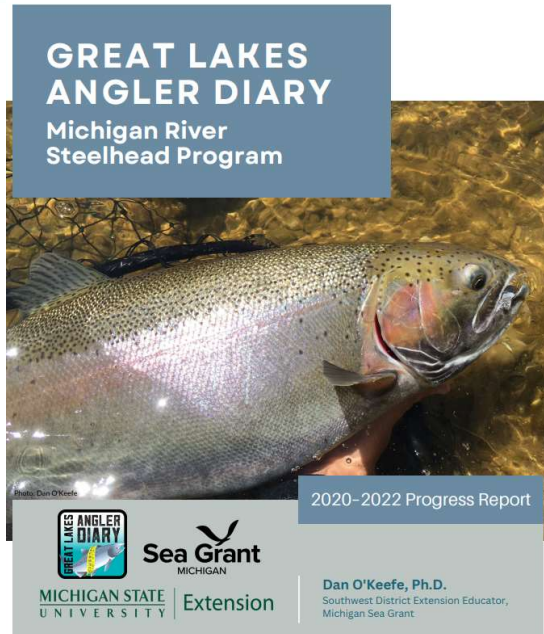
Sea Grant Michigan

Additional Information

- 2020-2022 Progress Report
- Year 3 Survey Report and slides from today
- MI Steelhead Program Resource Page



www.MichiganSeaGrant.org/GLAD



GREAT LAKES ANGLER DIARY
Michigan River Steelhead Program
2020-2022 Progress Report

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Dan O'Keefe, Ph.D.
Southwest District Extension Educator,
Michigan Sea Grant

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River Teams



Agency Partner – Local Michigan DNR biologist

Team Leader – Knowledgeable and well-connected local angler

Both help promote project and provide regular updates



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River Teams

<p>Betsie River Agency Partner: Heather Hettinger (MDNR) Team Leader: Fritz Heller</p> <p>Manistee River Agency Partner: Mark Tonello (MDNR) Team Leader: Jon Ray (Guide, Mangled Fly)</p> <p>Muskegon River Agency Partner: Mark Tonello (MDNR) Team Leader: Jeff Bacon (Guide, West Michigan Fly Fishing)</p> <p>Pere Marquette River Agency Partner: Mark Tonello (MDNR) Team Leader: Jim Bos (PM Watershed Council)</p> <p>White River Agency Partner: Mark Tonello (MDNR) Team Leader: Dane Ward (Trout Unlimited)</p>	<p>Grand River Agency Partner: Brian Gunderman (MDNR) Team Leader: Jim Bedford (Author, Trout Unlimited)</p> <p>Kalamazoo River Agency Partner: Jay Wesley (MDNR) Team Leader: Jay Wesley (MDNR)</p> <p>St. Joseph River Agency Partner: Brian Gunderman (MDNR) Team Leader: Jay Anglin (Anglin Outdoors)</p> <p>Lake Superior Tributaries Agency Partner: Cory Kovacs (MDNR) Team Leader: Open</p> <p>Lake Huron Tributaries Agency Partner: April Simmons (MDNR) Team Leader: Randy Terrian</p> <p>Huron River and Clinton River Agency Partner: Cleyo Harris/John Buszkiewicz (MDNR) Team Leader: Eric Lemaux</p>
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Questions?

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