



Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Jeannie Haddaway-Riccio, Secretary
Charles Glass, Deputy Secretary

2020 Muskellunge Volunteer Angler Survey Summary:

The Maryland Department of Natural Resources Freshwater Fisheries Program would like to thank all of the 2020 Volunteer Angler Survey participants for providing information. This data assists the department with the management of the upper Potomac muskellunge fishery. Since the development of our online reporting system in 2019, participation in this program has increased. This has enabled a more accurate understanding of the overall quality of this population and improves the ability to be proactive in managing the resource.

The Freshwater Fisheries Program has learned that volunteer angling is an efficient means of obtaining data for Potomac River muskellunge (Figure 1). The program uses volunteer angler survey data to calculate catch rates (catch per hour or hours per fish), size distribution, and mortality estimates on an annual basis. Angler catch data have also provided much larger samples of tagged recaptures to determine movement, growth, and an overall recapture rate (39 percent). These data help indicate the health and density of the population. Consecutive years of lower catch rates and/or decreasing average size would suggest that overfishing or excess mortality/harvest may be occurring. Fisheries managers could then adjust regulations accordingly to assure a high quality fishery is available for the angling public.

Prior to 2019, angler participation in the creel diary program was well below the observed number of anglers targeting Muskellunge on the river. To encourage participation the development of an electronic reporting application was created. Anglers can now save this app to any smartphone or personal computer and enter catch information electronically. For those who choose to continue with the paper copy, it can be printed [here](#).

Additionally, the following incentives exist for each participant:

- 1) Entry into a prize lottery
- 2) A custom Maryland Muskie hat and sticker (upon request; email josh.henesy@maryland.gov)
- 3) An annual summary report that includes the most recent updates on muskie management
- 4) The opportunity to be actively involved in the management/data collection of Potomac River muskies

To fully participate, all trips must be entered including days where zero fish were caught

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
# Caught	94	205	226	168	212	180	119	110	141	128	94
Angler Hours	545	1413	2988	2633	2839	1771	1480	1546.5	1104.5	1425	839
Total Catch/Hr	0.17	0.15	0.08	0.06	0.07	0.10	0.08	0.07	0.13	0.09	0.11
# of Trips	67	172	295	321	378	332	286	183	132	192	142
Hours/Fish	5.9	6.7	12.5	15.7	13.5	9.8	12.4	14.1	7.8	11.5	8.9
Participant #	5	10	15	16	15	13	12	12	11	25	33
Recaptures	14	19	15	12	20	14	6	14	18	15	8
Percent Recaptures	14.9	9.3	6.6	7.1	9.4	7.8	5	12.7	12.8	11.7	8.5
Mean Length	36.4	35.4	36	36.8	36	36.1	37.1	36.5	35.2	37.2	36.5

Figure 1. Summary of volunteer angler survey data (2010-2020)

The size distribution from the 2020 catch data is one that should be very attractive to anglers (Figure 2). The overall percentage of catchable size muskies (30-38", 38-42" and 42-50") are all above the long-term average (2000-2020).

Additionally, the proportion of 20-30" fish collected in 2018 signifies good reproduction in 2016 and 2017, which is good news for the future of muskies in the Potomac. These fish are now working their way through the population and contributing to the increases in catchable size fish. The contribution of 20-30" fish has proven to be a useful method in determining year-class strength 1-2 year prior since younger Muskellunge (< 25" or ≤ 2 years old) are not recruited to the larger gear (tackle) typically used to target muskie.

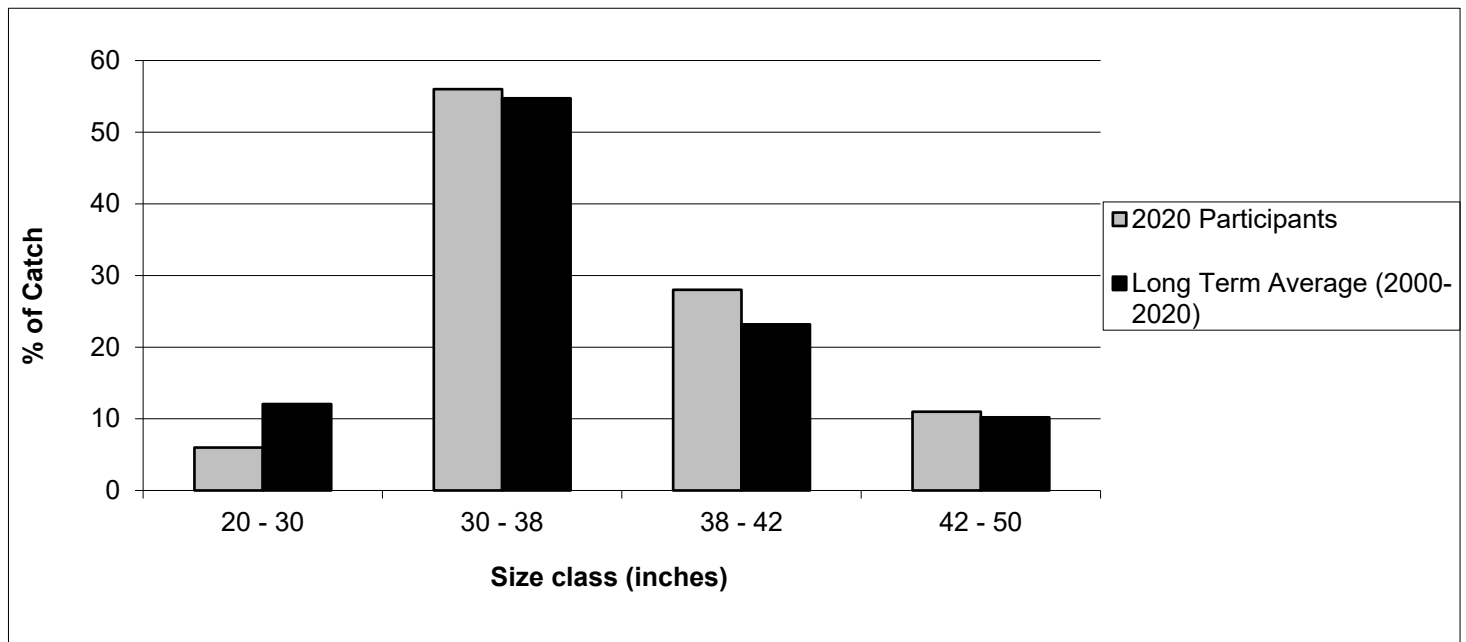


Figure 2. Incremental length-frequency distribution of angled Muskellunge from the volunteer angler diary program 2020 compared to the long term average (2000-2020)

2020 Management Updates:

The Potomac River muskellunge fishery has been growing in popularity. In order to ensure the success of this fishery the department wants to protect critical habitat and minimize delayed mortality of adult fish. Current data indicates that this fishery has a high voluntary catch & release rate (> 99 percent), among devoted muskellunge anglers, but does not take into account delayed mortality associated with angling when water temperatures reach stressful levels. Greater catch and release mortality may be occurring during summer months when water temperatures approach/exceed 80°F and fishing success and/or effort is highest (Figure 3). The Potomac River, along with other Mid-Atlantic and southeastern rivers, frequently reach temperatures considered lethal or chronically stressful to muskellunge. In order to better understand how these fish respond to the elevated river temperatures, a radio-telemetry project was initiated in 2017.

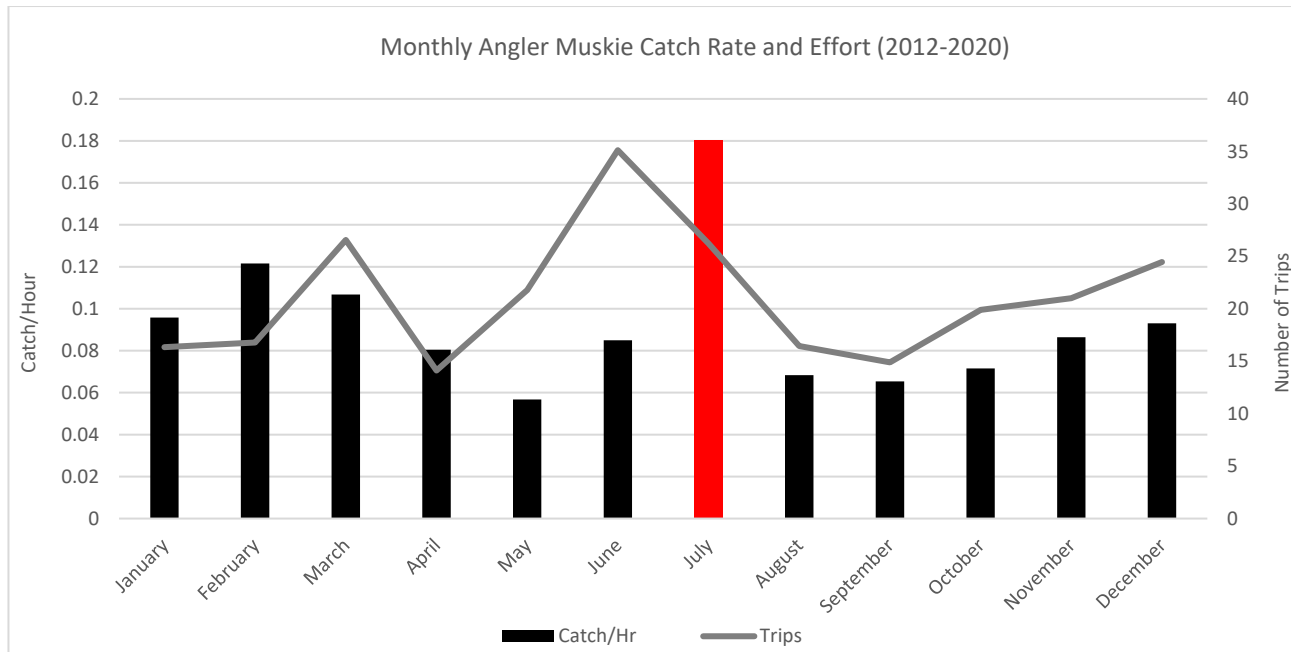


Figure 3. Monthly angler catch rate and effort reported from volunteer angler survey for 2012-2020.

From 2017-2020 the Freshwater Fisheries Program conducted a radio-telemetry tracking study on Potomac River muskellunge. These efforts showed that these fish are most mobile during spring (March-May) (Figure 4) and that muskellunge returned to the same spawning areas during consecutive years. Muskellunge remain rather sedentary during the other seasons (Figure 4), with an average movement of about 1 river mile. During summer months, movements decrease and muskellunge seek out the coolest water available based on their proximity at that time. This study provided evidence on muskellunge behavior during periods of thermal stress and documented the mainstem river temperatures when muskies seek thermal refuge.

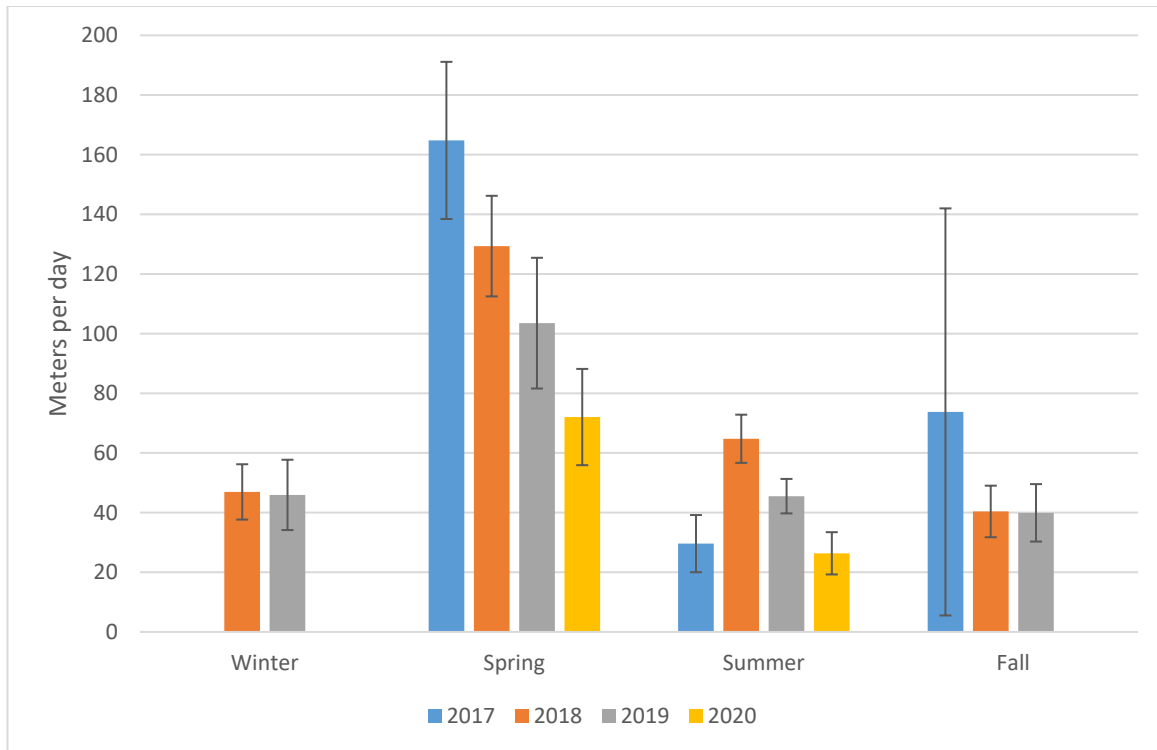


Figure 4. Seasonal movements by year for Potomac River Muskellunge.

Unique to the Potomac is the unrestricted public access, provided by the C&O Canal, which parallels the non-tidal Potomac in Maryland from Cumberland to Georgetown. Anglers can therefore target refuge habitats during summer months when muskellunge are concentrated in these locations. In order to better understand how these fish respond to angling during the thermally stressful summer months, angler participation is required. An additional 19 Muskellunge were implanted with radio transmitters in March of 2021 and each transmitter is equipped with a specialized mortality sensor that enables biologists to determine if the fish is still alive. Each fish is marked with two numbered yellow dart tags located along the leading edge of the dorsal fin (Image 1). Anglers who catch these fish should report their catch by removing one of the tags and mailing it to: 10932 Putman Road, Thurmont, MD 21788 (see below).

Angler participation is a necessary component of this project. Reporting tagged fish will enable us to best estimate the proportion of fish caught from the population. Freshwater Fisheries will apply angling related mortality estimates to our population estimates to better understand how angling is affecting the fishery at the population level.



Image 1. Two yellow anchor tags are used to identify transmitter tagged Muskellunge in the upper Potomac

Win a \$100 Visa Check Card!

To be eligible anglers must participate in one of the following:

- 1) Postcard Survey – Throughout 2021, pre-paid postcard surveys will be handed out to Potomac River anglers.

Fisherman who fully completes and submits this survey will be entered into a randomized drawing.

One entry per person.

- 2) Muskellunge Tag Return – Anglers who catch and return a tag (with required information) from a tagged Potomac River Muskellunge by December 31, 2021 will be entered into a randomized drawing.

To validate the catch, we are requiring anglers to physically remove the yellow tag so that the four digit numbers are legible and provide the anglers name and contact information (phone number or email), the general location of capture, and the length of the fish.

The fish does not have to be harvested to remove the tag.

- 3) Information should be mailed to:
10932 Putman Road
Thurmont, MD 21788

A total of 10, \$100 Visa Check Cards will be awarded. For additional information please visit the [Maryland Muskie Program website: https://dnr.maryland.gov/fisheries/Pages/recreational/Muskie.aspx](https://dnr.maryland.gov/fisheries/Pages/recreational/Muskie.aspx)

For information or questions regarding Potomac River muskellunge contact Josh Henesy:

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