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Harrison Lake 2020 Management Report Virginia Department of Wildlife Resources

Harrison Lake is an 82-acre impoundment located on U.S. Fish and Wildlife Service land in Charles City County. Harrison Lake serves as the main water supply for the Harrison Lake National Fish Hatchery. The lake provides anglers with a peaceful setting to try their luck on a variety of fish species. The lake is a valuable public resource for the Charles City County area. Access to the lake is free with the lake being open during daylight hours only. Some limitations on use go into play during the winter months with the gate to the entrance road being closed by hatchery staff. Facilities include a gravel boat ramp, courtesy pier and a few small fishing piers located from the peninsula adjacent to the dam.

The Virginia Department of Wildlife Resources sampled Harrison Lake on May 21, 2020. The previous, full community DWR electrofishing survey was conducted on May 18, 2015. The electrofishing effort of 3,600 seconds (1 hour) was used to attain a representative sample of all encountered fish species. The electrofishing effort consisted of shocking along the shoreline habitat as close as possible, with the majority of the effort concentrated in the 2 to 4 foot depth range. Effort was made to hold tight to the bank and shoreline brush as close as possible. The sample revealed a diverse fish assemblage with 14 species collected. The species that revealed the higher levels of abundance were creek chubsucker, bluegill, warmouth sunfish, redear sunfish, black crappie and largemouth bass.

Table 1. Summary of the primary fish species collected by electrofishing of Harrison Lake on May 21, 2020

Species	# Collected	Largest Length (in.)	Average Length (in.)
Largemouth Bass	13	20	8.83
Bluegill	99	7.91	3.87
Black Crappie	16	9.92	5.52
Redear Sunfish	21	8.7	5.94
Chain Pickerel	31	14.65	9.04
Bowfin	3	21.57	17.78
Warmouth	34	7.6	5.62

Largemouth Bass and Chain Pickerel

Harrison Lake provides a limited bass fishery. The survey collected 13 largemouth bass for a CPUE (Catch Per Unit of Effort) of 13 fish/hr. This catch rate showed a decline when compared to the 2015 survey (CPUE = 16 fish/hr). The 2012 survey yielded a more impressive catch rate of 40 fish/hr. This decline in catch rate might be explained by the fact that both the 2020 and 2015 surveys were conducted rather late in the spring when compared to the 2012 survey (April 2nd). An earlier survey allows for an increased chance at finding pre-spawn and spawning fish tighter to the shorelines. The catch rate of bass from Harrison Lake has never been very impressive as the fishery in general has some overall productivity limitations. The recent catch rates are well below the rate of most impoundments within the region. The mean catch rate of largemouth bass from Harrison Lake during surveys conducted from 2007 – 2015 was 37 bass/hr. The distribution of bass ranged from 4 to 20 inches, with only three fish greater than 12 inches in the collection. A positive sign of recruitment from the 2019-year class was observed with nine bass in the 4 to 7 inch range. The average sized bass measured only 8.83 inches, showing a slight increase from the 2015 survey (mean TL = 8.66 inches). Our sampling efforts are just a representative picture of the fish community collected along the shoreline on the sample day.

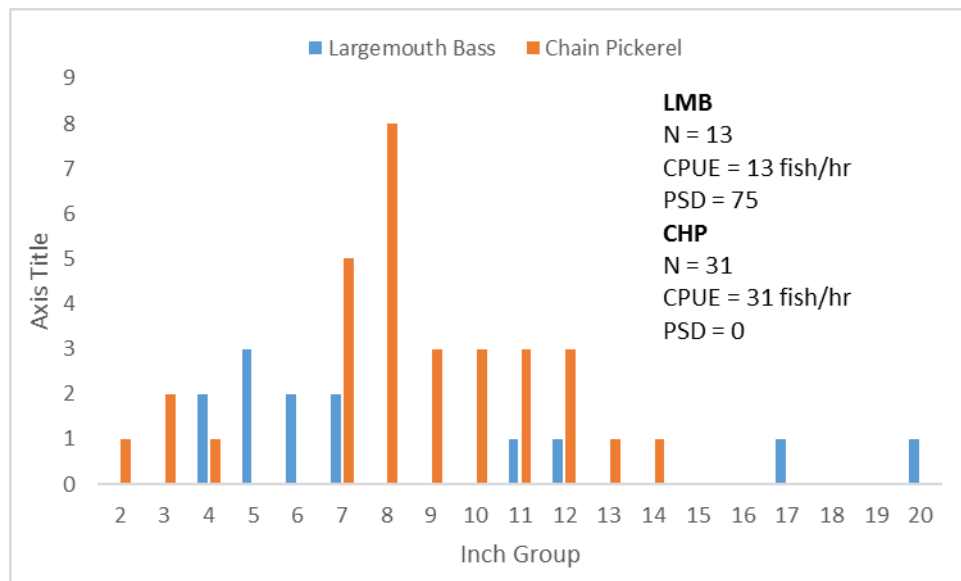


Figure 1. Length frequency distribution of largemouth bass and chain pickerel collected from the electrofishing of Harrison Lake, May 21, 2020

With largemouth bass being the most popular game fish in this country, it has been considered that a “preferred” bass is one that is over 15 inches in length. It is through this size classification that population dynamics are analyzed. The PSD (Proportional Stock Density) is the proportion of stock-sized bass (8 inches or larger) that are also equal to or greater than 12 inches (quality size). The limited sample set provided a PSD value of 37. This value reflected the collection of the four stock-sized bass in

which three fish fell into the quality-size range. A balanced bass/bluegill fishery has a bass PSD value within the 40–60 range. The PSD value is greater than the 2015 survey (PSD = 37) as well as the historic mean (PSD = 51). The RSD-P (Relative Stock Density of Preferred bass) is the proportion of bass of stock-size that are also equal to or greater than 15 inches in length. The RSD-P value of 50 reflected the presence of two preferred-sized bass, which showed a sizeable increase from 2015 (RSD-P = 12). Any insight into the PSD and RSD values must be considered in the context of the extremely small sample set of collected bass.

Weights were taken on largemouth bass to calculate relative weight values. Relative weight values are an indication of body condition. A value from 95 to 100 represents a fish that is in the healthy range and finding a sufficient amount of food. A higher relative weight value indicates fish with a better body condition. The relative weight values for stock, quality, preferred-sized bass (>8", >12", >15") were 92, 91 and 93 respectively. These values showed some similarities to the 2015 survey ($Wr_{\text{stock}} = 93$, $Wr_{\text{quality}} = 92$, $Wr_{\text{preferred}} = 88$). The catch rate of 2 preferred-sized bass/hr placed Harrison Lake near the bottom of the ranking table for public fishing waters sampled during 2020 in Region 1, District 1. The largest bass measured 20 inches and weighed 4.16 pounds. Harrison Lake produces a few larger bass over the years, but no large bass were encountered during this survey date.

The survey revealed an increased abundance of chain pickerel ($N = 31$; CPUE = 31 fish/hr) when compared to the 2015 survey (CPUE = 18 fish/hr). The chain pickerel length distribution was predominantly juvenile fish in the 2 to 14 inch range. Several YOY (Young of Year) in the 2 to 4 inch range were collected along with a blending of a few weak year classes of recruitment. The relative weight values of collected fish (stock = 99) revealed a slight increase from 2015 ($Wr_{\text{stock}} = 97$, quality = 93) as it appears that fish are finding an adequate amount of forage. Anglers have been able to catch a few larger chain pickerel from the lake over the last few years. The chance is always present to catch a larger pickerel, but anglers should expect more action from the juvenile-sized pickerel.

Bluegill and Redear Sunfish

Harrison Lake's bluegill fishery revealed similar results to past surveys with dominating presence of small fish less than 5 inches in length. The survey produced a total of 99 bluegill (CPUE = 99 fish/hr), which fell well below the 2015 survey (CPUE = 301 fish/hr). Bluegill length distribution ranged from 1 to 7 inches, with the majority of fish in the 2 to 5 inch range. Anglers that fish Harrison Lake should not expect to catch a stringer of larger bluegill. The PSD for bluegill is the proportion of bluegill over 8 cm (stock size) that are also at least 15 cm (quality size). The bluegill PSD of 18 reflected the collection of 12 quality-sized bluegill from the 68 stock-sized bluegill. The 2020 PSD value fell below the 2015 (PSD = 23), and the historic mean PSD value of 26. The 2020 PSD value fell below the desired range of 20 to 40 that would represent a balanced fishery. The presence of gizzard shad within Harrison Lake and the limited nutrients of the watershed may both have a factor in the low abundance of larger bluegill.

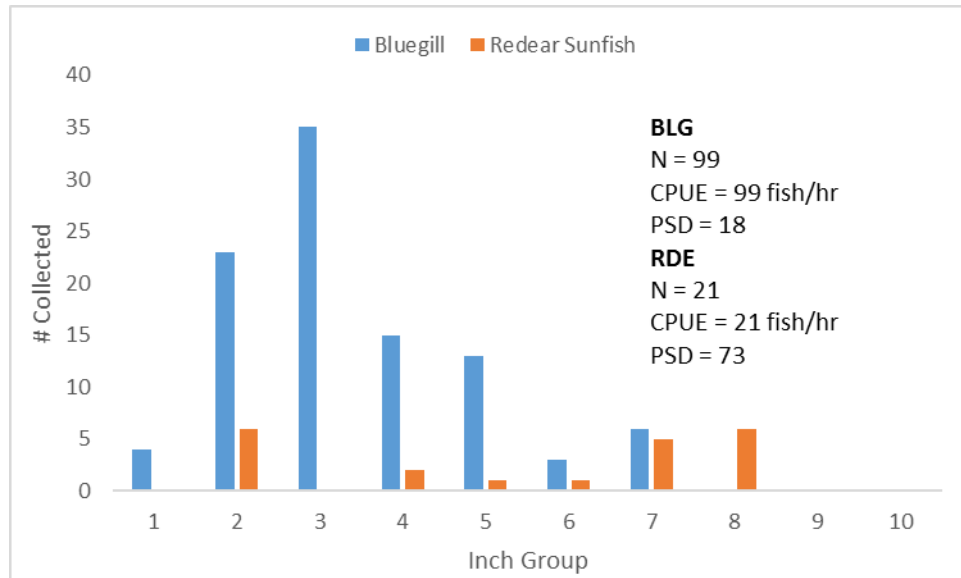


Figure 2. Length frequency of bluegill and redear sunfish collected from the electrofishing of Harrison Lake, May 21, 2020

The sample revealed a limited abundance of redear sunfish ($N = 21$; $CPUE = 21$ fish/hr) when compared to 2015 ($CPUE = 88$ fish/hr). The redear sunfish ranged in size from 2 to 8 inches, with a large percentage of the sample in the 7 to 8 inch range. The most productive run in terms of redear sunfish abundance was found along the cypress trees of the southern shoreline. The largest redear sunfish measured 8.7 inches with the average size at 5.94 inches. The average size redear sunfish showed a minor decline from the 2015 survey (mean TL = 6.01"). Young anglers may have better success in catching decent redear sunfish in the 7 to 9 inch range when compared to the limited number of larger bluegill that are present. The presence of the quality-sized redear sunfish might come as quite a nice surprise.

Black Crappie

The survey provided a limited abundance of black crappie. The black crappie sample ($N = 16$; $CPUE = 16$ fish/hr) matched the 2015 survey ($CPUE = 16$ fish/hr). Black crappie will typically retreat to deeper water after their spring spawn is complete. There is not that much deep water refuge within Harrison Lake. Schools of crappie can still stack up on some of the deeper break lines after they migrate away from the shallows. This makes it difficult to draw too many conclusions on the strength of the crappie population. If the population was really abundant, we most likely would have collected additional crappie along the deeper edges of the shoreline cover. The black crappie size distribution ranged from 3 to 9 inches, with a high proportion of fish in the 6 to 7 inch range. The average size for collected crappie measured in at only 5.52 inches, which showed a minor increase from 2015 (mean length = 5.49 inches). The relative weight values for stock-sized fish (87) and quality-sized fish (89) showed an unfavorable decline from the 2015 survey ($W_{rstock} = 90$, $W_{rquality} = 91$). All values were below the desired range of 95-100, but not many waters have crappie within that relative weight

range. Light tackle anglers looking for large black crappie action are best off fishing Diascund Reservoir and Chickahominy Lake.

Bowfin

Harrison Lake provides some angling opportunities for bowfin. The survey yielded 3 bowfin (CPUE = 3 fish/hr), which showed a decline from the 2015 survey (CPUE = 7 fish/hr). The bowfin size distribution ranged from 13 to 21 inches, with the average bowfin measured at 17.78 inches. The bowfin population will provide some excitement for anglers that are trying to catch bass and chain pickerel. The 2015 and 2020 surveys failed to yield any truly large bowfin from Harrison Lake. It just goes to show you that not every survey can be as exciting as the 2012 survey in which a trophy female bowfin of 31.3 inches and 10.65 pounds provided the most enjoyment. Harrison Lake has produced some citation-sized bowfin over the last few years. These larger fish will take advantage of the small bluegill and creek chubsucker forage base. Anglers should try their best to carefully release any caught bowfin while fishing Harrison Lake. Bowfin are a native fish species and they assist the fishery in culling stunted sunfish.

Additional Species

Harrison Lake has more diversity in the form of 8 additional species. Species collected in limited abundance were yellow bullhead (1), American eel (7), flier (7), pirate perch (1), golden shiner (1) and bluespotted sunfish (2). The creek chubsucker population is rather abundant with 118 collected (CPUE = 118 fish/hr). The juvenile creek chubsuckers in the 3 to 5 inch range will provide a valuable forage base for the various predator species. The survey produced a decent abundance of warmouth sunfish (N = 34; CPUE = 34 fish/hr), with the majority of fish in the 5 to 7 inch range. This variety of fish species may surprise anglers from time to time when the bluegill and black crappie are not cooperating.

Sample Summary

The electrofishing survey of Harrison Lake showed a diverse fishery consisting of 14 fish species. The largemouth bass population appears to be rather limited with only 13 bass collected. The 2020 survey along with the full community survey of 2015 did not reveal the greatest of bass catch rates. The length distribution of collected bass also left something to be desired. One of the positives that can be drawn from the bass collection is the presence of juvenile fish in the 4 to 7 inch range. The mid-May survey was not the most ideal time for a full assessment of the bass population. The limited sample set revealed the average-sized bass to be 8.83 inches in length. The largest bass measured only 20 inches and weighed 4.16 pounds. Anglers are recommended to release as many largemouth bass as possible to protect the current population. The protection of the brood-stock will hopefully allow for increased recruitment of juvenile bass over the next few years. Anglers are reminded about the Mercury health advisory on eating all fish species from Harrison Lake.

The bluegill population appears to have shown some level of decline with a CPUE of 99 fish/hr. The majority of the collected bluegill were less than 5 inches in length. The survey revealed a limited presence of quality-sized bluegill with only 12 collected. Similar to past surveys, the black crappie abundance was limited. The

collection of 16 black crappie ranged in size from 3 to 9 inches. The redear sunfish population appears to be in fair shape with a high percentage of fish in the 7 to 8 inch range. The chain pickerel population revealed an increase from 2015 with 31 fish collected. The pickerel population appears to be dominated by fish less than 13 inches in length. Recent angler reports some larger chain pickerel in the 2 to 3 pound range can be caught before the submerged aquatic vegetation becomes too thick. The survey produced a limited collection of bowfin with only three fish boated. The warmouth sunfish population appears to be fairly abundant with a high percentage of fish in the 5 to 7 inch range. Harrison Lake offers a wide variety of fish species for anglers to target. Anglers might want to keep an open mind and try fishing for these species with smaller lures or baits that would create strikes from crappie, warmouth and redear sunfish. The chance to catch larger fish in the form of bowfin and bass is available for anglers using larger lures and baits.

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