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Beaverdam Swamp Reservoir 2020 Fisheries Management Report **Virginia Department of Game and Inland Fisheries**

Beaverdam Swamp Reservoir is a 635-acre water supply reservoir for Gloucester County. It was constructed in 1989 and reached full pool level during the winter of 1989-1990. The reservoir and park provide a variety of opportunities for the outdoor enthusiast. The reservoir has plenty of interesting contour and structure. Several creek arms, numerous large points, and an abundance of flooded timber all add to the extreme variability of topography and fish habitat. The use of outboard engines is prohibited on Beaverdam Swamp Reservoir. The use of trolling motors is permitted. There are two boat ramps that anglers can use to launch their own private boats. The main ramp is located at the park off Route 616 and the other ramp is off Route 606. The Route 606 ramp offers easier access to the northern areas of the reservoir, but has been specifically designated for annual launch pass holders. Boat and equipment rental, bait, and snacks can be obtained at ranger's station at the main entrance. There is also a fishing pier, picnic facilities, and play areas for children. The park is open 7 days a week and every day of the year except for Christmas and New Year's Day. The concession and main boat ramp can be reached by taking Route 616 from Route 17 (Business), just to the west of Gloucester. For further details, please call the Ranger Station at (804) 693-2107.

The Virginia Department of Game and Inland Fisheries conducted an electrofishing survey of Beaverdam Swamp Reservoir on April 10th, 2019. The previous electrofishing survey was conducted on April 18th, 2017. A trap net survey was conducted during the spring of 2018, but an electrofishing survey was not conducted in 2018. The 2019 survey consisted of sampling along 5 standardized shoreline sites for a combined effort of 1.66 hours. The water temperatures varied from 18.3°C to 20.6°C (64.9°F to 69.1°F). Electrofishing efforts 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. The sample collected 12 fish species. This report will concentrate primarily upon the game fish species of largemouth bass, bluegill, redear sunfish and yellow perch.

Largemouth Bass

The largemouth bass population within Beaverdam Swamp Reservoir appears to be in great shape. A total of 196 largemouth bass were collected. The CPUE (Catch Per Unit of Effort) for largemouth bass was 117.6 fish/hr. This catch rate showed a favorable increase from the 2017 survey (CPUE = 72 fish/hr), along with being greater than the average CPUE value (years 1996-2017) of 76.5 fish/hr. The date of the survey, April 10th, was conducted at a prime time for the largemouth bass as the majority of collected fish were starting to pair up for the spawn. The collected bass were holding close to shoreline cover with some bass along the outside edges of flooded timber. The length distribution of collected bass ranged from 5 to 21 inches, with a high proportion of bass in the 11 to

17-inch range length. Based on the length frequency distribution alone, it appears that a couple strong year classes of recruitment are cycling their way through the population. The average-sized bass measured 13.59 inches.

The CPUE of preferred-sized bass (≥ 15 inches) was incredible at 50.4 fish/hr. This catch rate showed a favorable increase from the 2017 survey (CPUE_{preferred} = 34.8 fish/hr). The 2019 CPUE of preferred-sized largemouth bass is the highest on record for Beaverdam Swamp Reservoir. Beaverdam Swamp Reservoir receives an excessive amount of fishing pressure from the various bass tournaments throughout the year. Anglers are encouraged to try different fishing techniques that might trigger some of the larger bass into biting. The 2019 survey revealed an increased presence of juvenile bass with a catch rate of 11.4 fish/hr. This CPUE showed an increase from the 2017 survey (CPUE_{young} = 5.4 fish/hr).

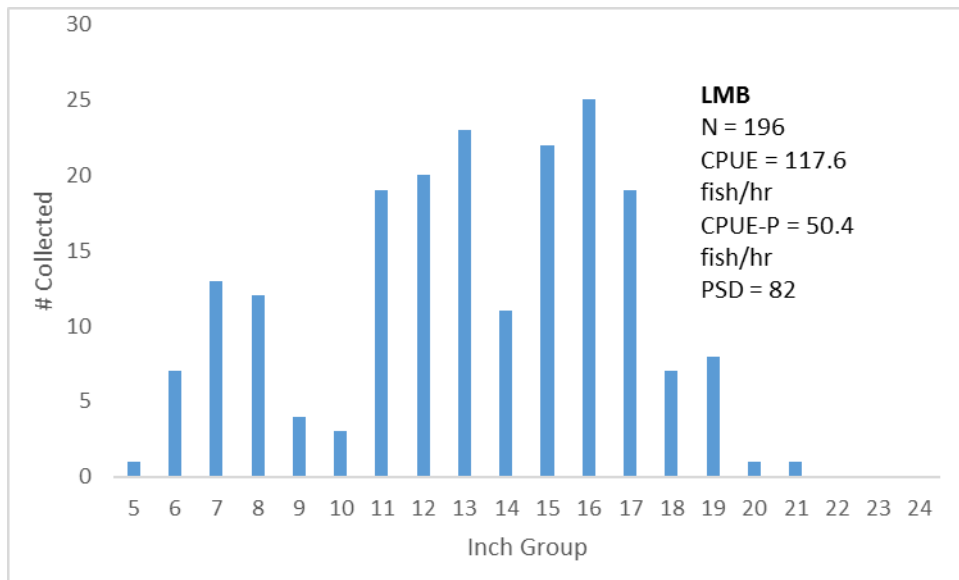


Figure 1. Length frequency distribution of largemouth bass collected from the electrofishing survey of Beaverdam Swamp Reservoir on April 10th, 2019

Fisheries biologists of the past established certain size classifications to describe the fish they collected. It is through these size classifications that population dynamics are analyzed. The size designations are stock, quality, preferred, memorable, and trophy. 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). A balanced bass/bluegill fishery has a bass PSD value within the 40–60 range. 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. The RSD-P (Relative Stock Density of Preferred bass) is the proportion of stock-sized bass that are also equal to or greater than 15 inches in length. The PSD and RSD-P values represent the distribution of collected fish, but one must take into account the total number of bass collected along with the total of stock-sized bass in the sample.

The 2019 survey revealed a PSD value of 82, which is a direct reflection of the 145 quality-sized bass from the total of 177 stocked-sized bass. The PSD value falls well above the desired PSD range of 40-60. The PSD value actually showed a favorable decline from the 2017 survey (PSD = 87), but still showed a population with a high proportion of larger bass present. The 2019 RSD-P value of 47 is a direct reflection of the 84 preferred-sized bass collected. The RSD-P value showed a slight decline from 2017 (RSD-P = 49).

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 decent amount of food. A higher relative weight value indicates fish with a better body condition. The relative weight values for stock, quality and preferred bass ($\geq 8''$, $\geq 12''$, $\geq 15''$, $\geq 20''$) were impressive at 103, 105, 106, and 112, respectively. These values showed some similarities to the 2017 survey ($W_{\text{stock}} = 105$, $W_{\text{quality}} = 106$, $W_{\text{preferred}} = 105$, $W_{\text{memorable}} = 91$), except for the two memorable-sized bass being in a much improved body condition. The two largest bass collected in 2019 weighed 6.5 and 5.4 pounds. The 2019 relative weight values fell well above the desired 95 to 100 range. The bass are finding a plentiful supply of available forage fish that they can prey upon. Large schools of juvenile gizzard shad have recently been found in various regions of the reservoir. This forage base of juvenile shad in the 2 to 6-inch size range will provide adequate food for the bass population while the general trends in the bluegill population have shown a decline.

Bluegill and Redear Sunfish

The electrofishing survey was successful in collecting 153 bluegill (CPUE = 91.8 fish/hr). This catch rate showed a favorable, but minor increase when compared to the 2017 survey (CPUE = 75 fish/hr). The bluegill size distribution ranged from 2 to 7 inches, with a high proportion of fish in the 5 to 7-inch range. The survey revealed a higher than average presence of bluegill greater than 6 inches in length. The PSD for the bluegill population is the proportion of quality-sized bluegill (5.9 inches or greater) in relation to the total number of stock-sized bluegill (3.15 inches and greater). The bluegill PSD value of 64 showed a large increase from the 2017 survey (PSD = 39) and an elevation above the desired range of 20-40. This record PSD value represents the limited presence of stock-sized fish in the 3 to 5-inch range. The 2019 sample consisted of 93 quality-sized bluegill greater than 5.9 inches in length. The survey produced a total of 146 stock-sized fish. The recent average PSD for bluegill (years 1996 – 2017) is 24. The largest bluegill measured 7.76 inches and the average-sized bluegill measured in at 5.88 inches. The high abundance of yellow perch, white perch, and black crappie have had an impact on the survival rate of juvenile sunfish.

The redear sunfish population appears to be in fair shape. A total of 38 redear sunfish were collected during the survey (CPUE = 22.8 fish/hr). This catch rate showed an increase when compared to the 2017 survey (CPUE = 9.6 fish/hr). The size distribution ranged from 2 to 11 inches, with the majority of the fish in the 7 to 9-inch range. The average size redear sunfish measured 8.19 inches in total length. The largest redear sunfish measured an impressive 11.34 inches. Beaverdam Swamp Reservoir may not have the greatest concentration of redear sunfish, but the fishery has the capacity to

produce a few large fish that reach the 10 to 11-inch mark. Redear sunfish tend to congregate along the banks for the spawning season during the early May time period. The survey was similar to past years in revealing poor representation of juvenile reardear sunfish. The survey collected only 1 reardear sunfish less than 6 inches in length. This week recruitment falls in line with the decreased abundance of bluegill. The black crappie population, although not well represented in this electrofishing survey, is very abundant and may be teaming up with the yellow and white perch populations to forage heavily on sunfish fry and fingerlings.

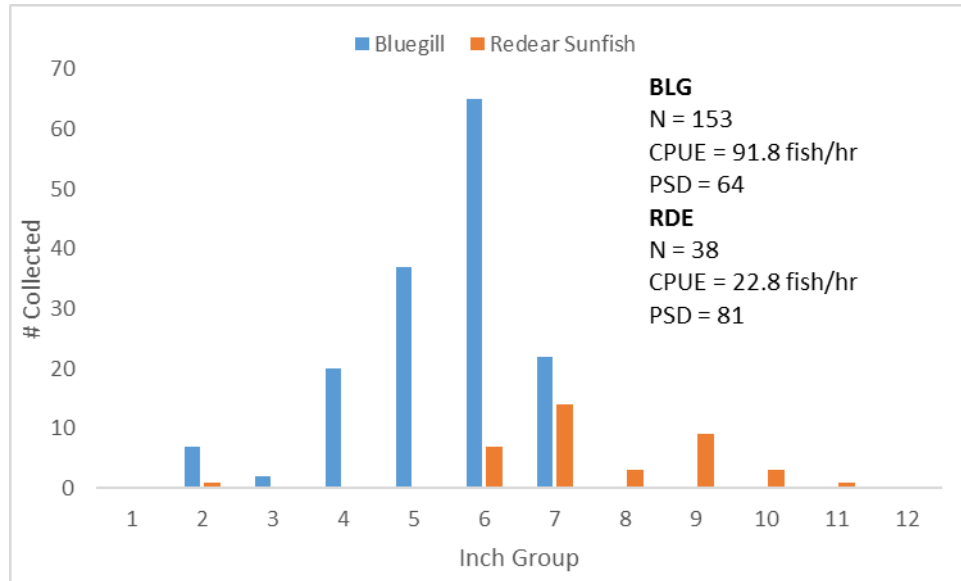


Figure 2. Length frequency distribution of bluegill and redear sunfish collected from the electrofishing survey of Beaverdam Swamp Reservoir on April 10th, 2019

Yellow Perch

The electrofishing survey collected a total of 119 yellow perch (CPUE = 71.4 fish/hr). This catch rate showed a major decline from the 2017 survey (CPUE = 217.8 fish/hr). Yellow perch size distribution was less than exciting at 3 to 8 inches, with the vast majority in the 5-inch size class. The smallest yellow perch measured 3.27 inches, with the largest perch at 8.1 inches. The average length for collected yellow perch was 5.27 inches. It is quite possible that the larger perch were holding in deeper water and not near the shoreline.

Yellow perch will be the first fish species to spawn in Beaverdam Swamp Reservoir, followed thereafter by the chain pickerel population. The schools of perch will congregate in areas where they can find any submerged aquatic vegetation that has survived the winter. Yellow perch will deposit fertilized eggs in the aquatic vegetation and then migrate back to deeper water. There is no parental care given to the eggs or any hatched perch fry. The rather recent explosion of hydrilla growth in the reservoir has created favorable conditions for yellow perch survival. The decreased abundance of the chain pickerel population has allowed a large percentage of yellow perch to survive. Beaverdam Swamp Reservoir has historically produced a decent number of citation-sized

yellow perch for anglers that are set on targeting them. The last few years have seen a decline in the number of citations caught. The increased abundance in the white perch population may be the direct reason for a decline in trophy yellow perch abundance. Variable year class strength may also have some impact as well. A citation-sized yellow perch needs to be either 12 inches in length or weigh 1.25 pounds. Larger perch are present as it seems they prefer to be caught on jigs and minnows instead of electrofishing methods. Anglers are encouraged to harvest the medium-sized yellow perch from Beaverdam Swamp Reservoir and release as many of the larger perch as possible.

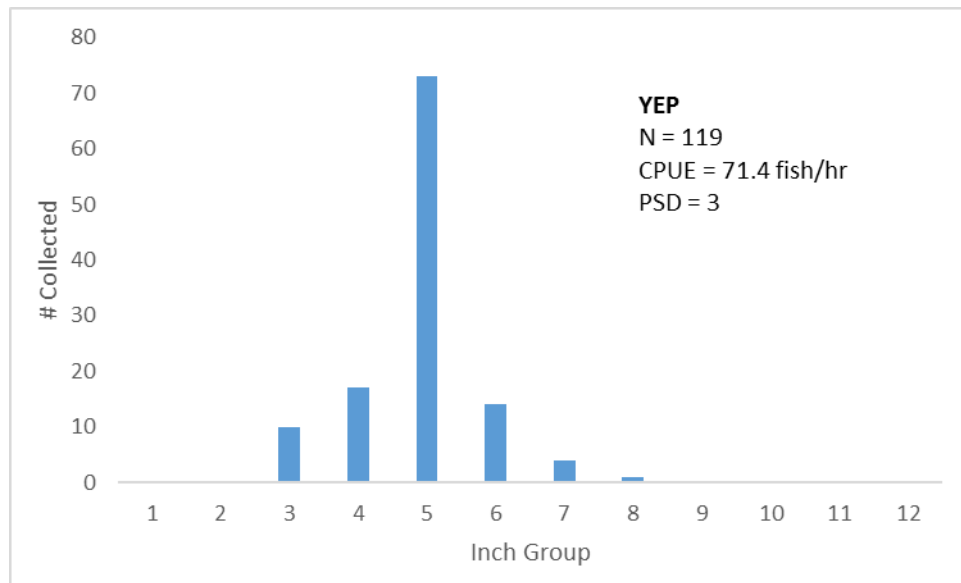


Figure 3. Length frequency distribution of yellow perch collected from the electrofishing survey of Beaverdam Swamp Reservoir on April 10th, 2019

Additional Fish Species

The survey collected a total of 55 gizzard shad for a CPUE of 33 fish/hr. Collected shad ranged in size from 10.16 to 15.43 inches. The average sized gizzard shad measured an impressive 14.23 inches with an average weight of 1.17 pounds. These brood stock gizzard shad will be called on to produce the next generation of juvenile shad that will feed the various predator species in the reservoir. The survey revealed the presence of 20 chain pickerel for a CPUE of 12 fish/hr. This catch rate was not the most overwhelming by any means, but did show a favorable increase when compared to the 2017 survey (CPUE = 1.2 fish/hr). Collected chain pickerel ranged in size from 9.84 to 19.76 inches with the average length at 12.7 inches. Anglers may be surprised by a larger chain pickerel from time to time, but don't expect to catch too many of them. Chain pickerel are a native fish species that serves an important role in consuming juvenile perch.

The black crappie population is extremely strong within Beaverdam Swamp Reservoir. Black crappie will spawn relatively early in the spring and will retreat to deeper water after the spawn. Recent electrofishing surveys have had a poor time collecting black crappie. The 2019 survey collected a total of 19 crappie for a CPUE of 11.4 fish/hr. This CPUE showed an increase from 2017 (CPUE = 3.6 fish/hr). Collected

crappie from this limited sample set ranged in size from 6.18 to 13.98 inches with the average length at 9.22 inches. The crappie population receives an exorbitant amount of harvest during the months of January through March when schools of crappie by the hundreds if not thousands, make their way into the shallows to feed. Anglers are encouraged to enjoy the exciting fishing action, but are discouraged from harvesting their daily limit every time they fish the reservoir. Release of crappie in the size range of 12 to 15 inches is recommended to keep the fishery as a popular destination to catch citation-sized fish. The 2018 trap net survey collected a total of 291 black crappie for a CPUE of 14.55 fish/net night. This catch rate showed a large decline from the previous trap net survey of 2014 that collected 938 crappie (CPUE = 46.9 fish/net night). The 2018 length distribution ranged from 8 to 15 inches with the majority of fish in the 9 to 11-inch range. The presence of older fish greater than 12 inches in length had showed a decline. This is the size range of fish that needs to have increased protection, not harvest. DGIF hatchery staff along with a DGIF Fisheries Biologist conducted supplemental black crappie fingerling stocking in 2018. It will take a few years to see if these stockings have any impact on creating stronger recruitment and banner year class strength.

The remaining fish species collected in rather low abundance during the electrofishing survey were: brown bullhead (N = 1), creek chubsucker (N = 2), American eel (N = 2), golden shiner (N = 4), and green sunfish (N = 2). These fish species provide some diversity to the fishery and the possibility of exciting an angler from time to time.

Although not collected during any of the recent surveys, channel catfish are present within the reservoir and offer anglers another fishing opportunity worth exploring. A few dedicated anglers have been able to catch some respectable catfish over the years. Another species not found during the electrofishing survey was white perch. The reservoir has an abundant population of white perch with fish caught by anglers up to 12 inches in length. A few large year classes of white perch have been found by experienced anglers. Anglers can find exciting action from this tasty pan fish if they concentrate their efforts fishing the deeper water. Your typical black crappie jigs will come in handy while fishing for white perch.

Gill Net Survey

The Virginia Department of Game and Inland Fisheries staff conducted a gill net survey of Beaverdam Swamp Reservoir over the course of November 18th to 20th, 2019. The purpose of the gill net survey was to gather data on the white perch population. White perch will typically hold in deeper water off the shoreline and have the tendency of staging in tight schools in open water. The shoreline electrofishing survey of 2019 collected zero white perch. Anglers have been reporting recent catches of abundant white perch with some fish reaching quality-size. Gill nets with bar mesh sizes of 1" and 1.25" were used in sets along the main creek channel in hopes of targeting these pelagic areas. Six nets were used each night.

The survey collected nine fish species with white perch being the most abundant. A total of 173 white perch were collected for a CPUE of 31.5 fish/100 m². This was the first time DGIF staff has set out with the sole purpose of catching white perch from Beaverdam Swamp Reservoir. Collected fish ranged in size from 16-30 cm (6.5 – 12 inches). The average size white perch was about 15.4 inches. Mean TL was at least 13 inches at age 4. The gill net survey revealed a decent amount of species diversity with the

collection of 12 black crappie, 5 gizzard shad, 4 largemouth bass, 2 bluegill, 2 chain pickerel, 1 brown bullhead, 1 golden shiner, and 1 green sunfish. Shoreline set nets would most likely have collected a higher abundance of these fish species, but the bottom set nets in the main channel were used for a higher return on white perch.

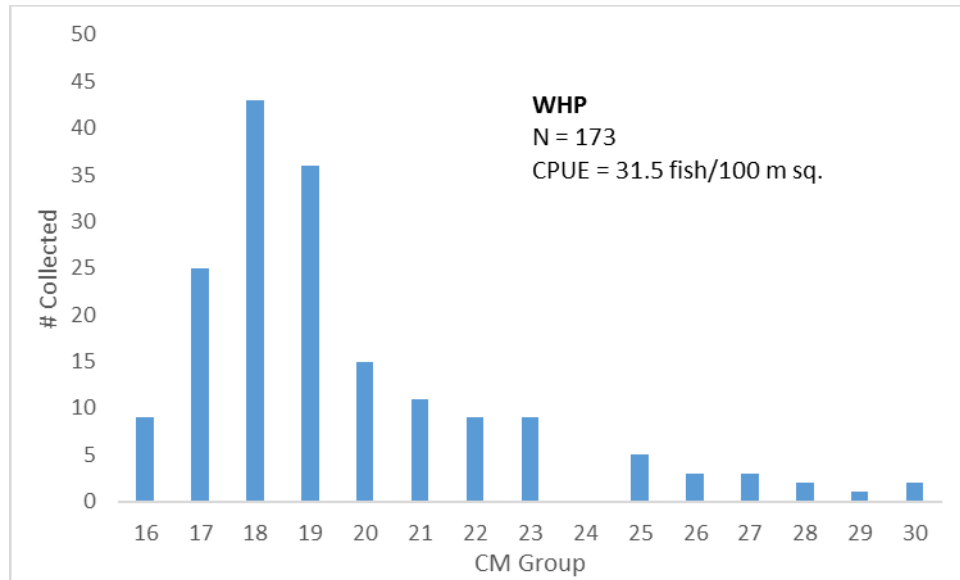


Figure 4. Length frequency distribution of white perch collected over the course of the gill net survey on Beaverdam Swamp Reservoir (November 18th-20th, 2019)

Summary:

The electrofishing survey of Beaverdam Swamp Reservoir collected a total of 12 fish species. The primary fish species collected were largemouth bass, bluegill, and yellow perch. These species comprised the majority of the fishery’s biomass. The fishery has an abundance of black crappie that were not represented during the survey. The reservoir continues to provide quality bass fishing action even though the numbers of citation-sized bass has dropped over the last few years. The majority of the bass sample consisted of a high proportion of bass in the 11 to 17-inch range. The survey collected 196 largemouth bass for a catch rate of 117.6 bass/hr. The catch rate of preferred-sized bass (≥ 15 inches) showed a favorable increase to 50.4 fish/hr, which was an all-time record for the reservoir. The 2019 survey revealed the catch rate of preferred-sized bass to only trail behind Lake Chesdin for all public impoundments in Region 1, District 1. The collected bass revealed desirable relative weight values when compared to past surveys. Bass were in healthy condition and finding an adequate supply of forage.

The bluegill fishery has experienced some change over the last few years. The extremely high catch rates of the past have shifted to reveal a lower abundance of juvenile fish. The 2019 catch rate of 91.8 bluegill/hr is poor when you assess the abundance of yellow perch, white perch, and black crappie that are present. On a positive note, the proportion of bluegill greater than 6 inches in length showed an increase from past surveys. Overall abundance of redear sunfish is not very impressive even though the

catch rate showed a minor increase from the 2017 survey. The average sized redear sunfish measured an impressive 8.19 inches in total length. The reservoir has historically been one of the better reservoirs to fish for yellow perch. Based on results from the 2019 survey, the yellow perch population has shown a recent decline in abundance with the CPUE of 71.4 fish/hr. Anglers have been catching an abundance of white perch from the reservoir lately. The 2019 gill net survey was successful in catching a decent abundance of white perch with fish reaching sizes that would be of interest to anglers. The variety of fish species within Beaverdam Swamp Reservoir will provide excitement for anglers on the Middle Peninsula of Virginia that want a taste of freshwater action.

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