



**Burke Lake Management Report**

*Popular Report*

**Federal Aid Project – F111R**

**January 2024**

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Burke Lake is a 218-acre Department owned fishing lake in Fairfax County within the boundaries of Burke Lake Park. The Virginia Department of Wildlife Resources (VDWR) owns Burke Lake, but the surrounding 650-acre park is owned and operated by the Fairfax County Park Authority. The close proximity of this lake to Washington, D.C. contributes to it being one of the most heavily fished small impoundments in Virginia. The most recent creel survey (March through October 1998) recorded 27.7 angler hours per acre. Burke Lake offers anglers a typical warm water fishery comprised of Largemouth Bass, Bluegill, Redear Sunfish, Black Crappie, Yellow Perch, White Perch, Yellow and Brown Bullheads, and Channel Catfish; however the lake also offers rather unconventional (for northern Virginia) Saugeye and Muskellunge fisheries. The lake is stocked annually with Saugeye, Muskellunge and Channel Catfish, while the other species are maintained through natural reproduction. Saugeye have done well and offer anglers a unique opportunity to catch a traditionally northern species. Muskellunge survival and growth was historically very good at Burke Lake, but over the years this population fluctuated due to lack of consistent stocking. However, recent samples have been highly encouraging.

The lake is fertilized annually to stimulate the aquatic food chain. The added nutrients increase the lake's productivity and overall fish production but are used within the system without adding to nutrient loads downstream. In 2017, James Madison University was contracted to conduct a study on impoundments to evaluate nutrient budgets and assess the effectiveness of VDWR's fertilization program and to ensure impacts downstream were negligible. This initiative was due in large part to the 2010 United States Environmental Protection Agency (EPA) Total Maximum Daily Load (TMDL) nutrient reduction strategy. Results confirmed that the VDWR impoundments fertilized acted as nutrient sinks with no export of nitrogen or phosphorous.

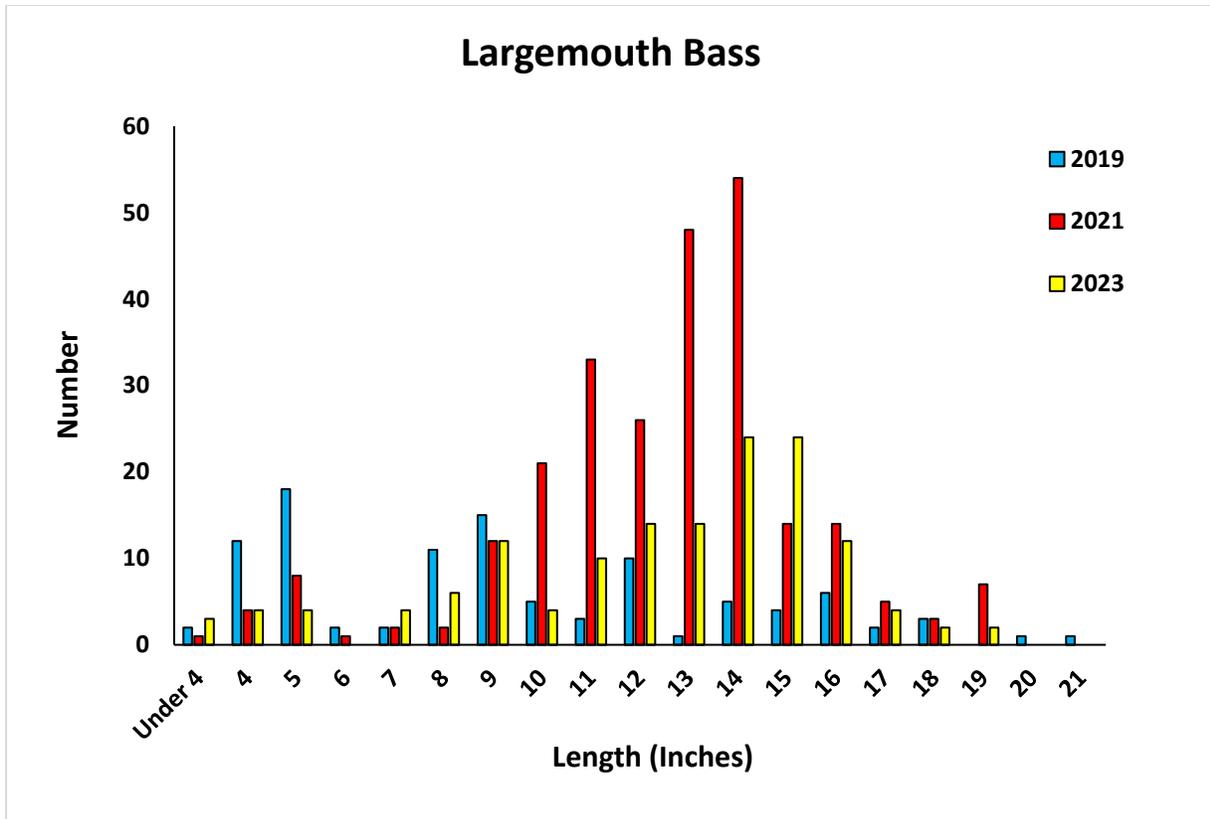
Burke Lake is sampled on a regular basis by electrofishing to get an accurate picture on the status of the fishery. Electrofishing is an active sampling method used to sample fish populations to determine abundance, density, and species composition. Saugeye electrofishing is done at night, as the species is primarily nocturnal and enters shallow water during early spring. Historically, Burke has consistently been one of the top NOVA district waters for catch rate of Largemouth Bass and currently ranks 4th.

DWR fisheries biologists have sampled the fishery every year since the illegal introduction of Northern Snakehead in 2014 to monitor potential effects on the fish community. The most recent survey was conducted in May 2023. Biologists use shoreline electrofishing to obtain estimates of population size structure and relative abundance. Abundance is usually described as a catch rate in number of fish per hour (CPUE, or Catch per Unit Effort). Biologists employ numerical descriptors of length-frequency data such as Proportional Stock Density (PSD) and Relative Stock Density (RSD) when evaluating fish populations. PSD is calculated by dividing the number of fish  $\geq$  minimum quality length by the number of fish  $\geq$  minimum stock length x 100. Quality length is defined as the minimum size of fish most anglers like to catch (these are by national standards -for example, 12" for Largemouth Bass). Stock length is the minimum length at which a fish provides recreational value and/or is recruited to the fishery (8" for Largemouth Bass). RSD is the percentage of any designated length group found within a population. RSD is calculated by dividing the number of fish  $\geq$  specified length by the number of fish  $\geq$  minimum stock length x 100. Preferred bass are those 15" or larger, while memorable fish are those 20" or larger.

## ***Largemouth Bass***

The population size structure of Largemouth Bass in 2023 was better than the previous samples. The Proportional Stock Density (PSD) value was 78 in 2023, higher than the previous samples of 2019 (50) and 2021 (75). A PSD value of 40-70 indicates a balanced fish population. Relative Stock Density of Preferred fish (RSD-P; ratio of adults greater than 15") increased to 42 in 2023 (22 in 2021 and 28 in 2019), suggesting a shift in the population towards larger fish. Catch per unit effort (CPUE) of Largemouth Bass was a very respectable 143 fish/hr, similar to 2019 but lower than 2021. CPUE of preferred size bass was significantly greater in 2023 and 2021 (54 and 52 fish/hr) than in 2019 (26/hr). This shift suggests the lake had a surplus of forage and/or strong bass year classes recruited to this size group.

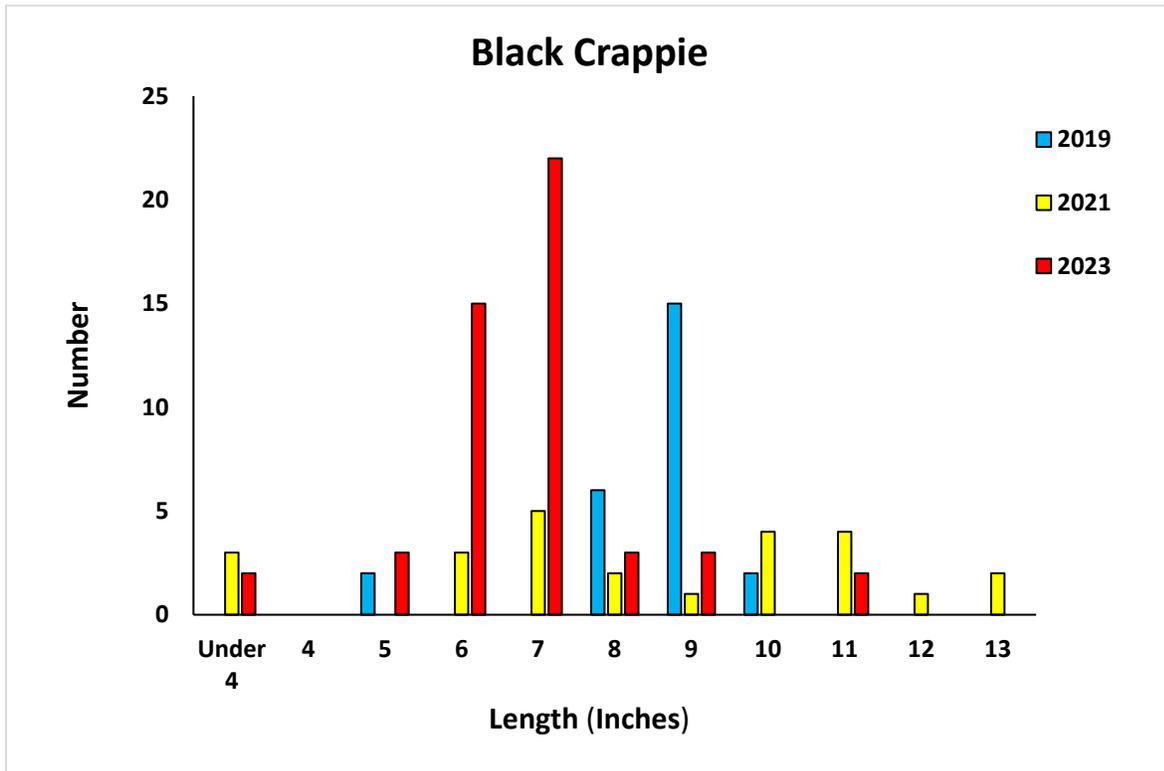
The Largemouth Bass population of Burke Lake is in excellent condition with bass averaging around 3 pounds and 6+ pound bass available. Due to the combination of fishing pressure and abundant forage; Largemouth Bass can be difficult to catch at Burke Lake as bass feed heavily upon schools of gizzard shad. Anglers are encouraged to try different techniques not normally used by average fishermen. The use of a different lure or retrieve may turn out to be what the bass are looking for. A good fish finder will allow you to find schools of shad and the bass feeding on them. Anglers should try a variety of shad/bait fish imitating lures such as crank baits (lip-less and diving) and soft plastic jerk baits as well. Burke Lake has consistently ranked at or near the top of the list of 18 impoundments in the NOVA district for CPUE of preferred bass. Currently, Burke is ranked 6th in the district for CPUE-P. Anglers are encouraged to practice catch and release on larger bass, as their value to the fishery can provide enjoyment for the many other anglers that fish the lake.



## *Black Crappie*

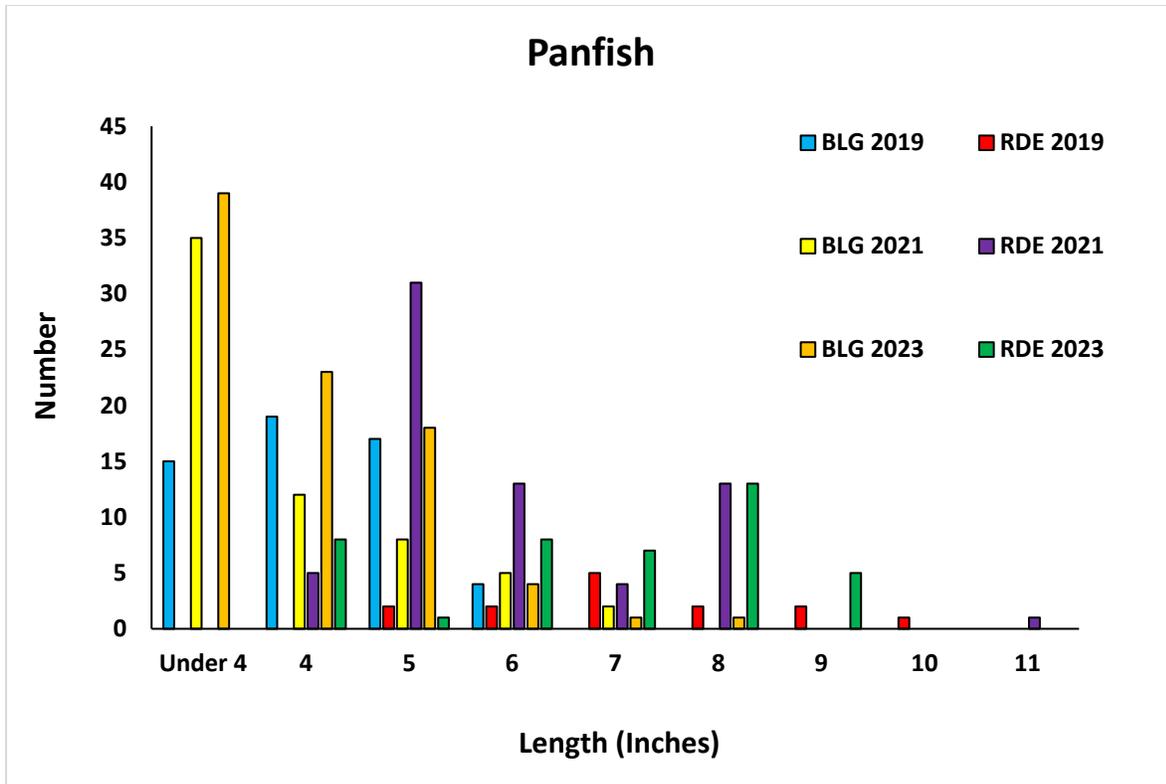
Black Crappie (BLC) electrofishing CPUE was higher in 2023 (50 fish/hr) than those of 2021 and 2019 (25 and 34 fish/hr). Burke Lake provides an average Black Crappie fishery with numerous fish in the 6-9 inch range. The lake has produced fish in the 2+ pound range with the lake record being 3.5 pounds. Proportional Stock Density (PSD) decreased significantly in 2023 to 27 from the previous year's samples of 64 and 92. A PSD of value of 30-60 is indication of a balanced population. The PSD values suggest the population is close to balanced but is lacking some of the larger fish. Crappie populations are known for fluctuating due to high annual variation in spawning success. Black Crappie are generally considered undesirable in small impoundments due to their ability to quickly overpopulate and stunt. Anglers targeting crappie should focus on underwater structures and fish 6 to 8 feet deep. Anglers are encouraged to try

fishing small crappie jigs, tubes, jig heads tipped with small minnows or Beetle Spins. Anglers are also encouraged to harvest any crappie caught up to the 25-fish/day creel limit. Crappie are readily available lake-wide from the spring to early summer months.



## ***Panfish***

Bluegill (BLG) electrofishing PSD decreased to 26 in 2023 from 44 in 2021, but both greater than 10 in 2019, which suggests the population is close to balanced and stable. CPUE increased to 86 fish/hr from 62 fish/hr in 2021 and 74 fish/hr in 2019. Redear Sunfish PSD values have fluctuated amongst the years (71 in 2019, 37 in 2021, and 50 in 2023). CPUE values have similarly fluctuated from 2019 (19 fish/hr), 2021 (67 fish/hr) to 43 fish/hr in 2023. Panfish fisheries are typically considered balanced when PSD falls in the range of 20 – 60. Both populations appear to be balanced. Ample opportunities exist for anglers to target panfish during spring/summer when fish move shallow to spawn and are easily accessible to bank or boat anglers. Natural baits such as worms or crickets tend to work best. Anglers just need to be mindful that most fish caught will be less than 8 inches. There is no size limit on sunfish (Bluegill, Redear Sunfish, Warmouth, etc.) in Burke Lake, and anglers can harvest 50 sunfish (combined) per day. Anglers are encouraged to harvest these species in hopes of thinning the populations to allow for increased growth and eventually larger fish. Opportunities also exist to catch White and Yellow Perch at Burke Lake, with harvest of these species also highly encouraged.



### *Other Fish*

Burke Lake provides a good Channel Catfish fishery. The lake was initially stocked with Channel Catfish in 1964 and receives annual stockings of 10/acre. Burke Lake has produced numerous catfish in the 10-15 pound range with the lake record being 21 lb. 8 oz., caught in 1999. Anglers are encouraged to fish along the shore to find that perfect little hot spot. Ten (10) Channel Catfish per day can be harvested. Anglers can catch them on a variety of baits including night crawlers, minnows, chicken livers, stink baits and cut bait. If bigger Channel Catfish is what you're after then cut bait is the way to go.

Muskellunge, more commonly referred to as Musky, are the top predators in this impoundment. Muskies are normally stocked annually at a rate of 3 fish/acre. 5 were observed during Walleye night electrofishing surveys in 2023, 6 in 2021 and 40 in 2019 (many of which were fingerlings) assuring a stable population still exists. Previously, trap nets were set to collect

Musky but minimal success resulted in ceasing the effort. Observations during night electrofishing for Walleye has proven more successful and is now the monitoring method. Three Musky were also observed in the 2023 community sample. There is a 30-inch minimum size limit on musky at Burke Lake and anglers can harvest 2 per day if they so desire. There are many Musky baits that can be effective such as inline spinners, crankbaits, top water, soft plastics, and jerk baits. The inline spinner or top water baits can be very good from May to July and are easy to use. Crank baits and soft plastics are good choices in the fall and winter months when Muskies tend to target larger prey items. Muskies are commonly caught in lakes by trolling deep water with large crankbaits, spoons, and inline spinners. Fish near the base of the thermocline (around 7 to 9 feet) during summer months.

Walleye were initially stocked in 1979 to provide a diversified fishery and are typically stocked annually at 100 fingerlings/acre to maintain the fishery. Burke Lake received 150 fingerlings/acre from 2014-18 as part of a study to evaluate variable stocking rates. During March and April 2018, the Walleye population was sampled at night with boat electrofishing. Totals of 143, 102 and 33 Walleye were collected in 2019, 2021 and 2023 for above average catch rates of 37, 22 and 11 fish/hr (the goal for small impoundments is  $\geq 10$  fish/hour). Burke was drawn down for a shoreline project most of 2023 resulting in low to no water in the usual spots they congregate in spring, resulting in lower than normal catch rates. Walleye have been stocked in numerous lakes, as these excellent eating fish have become a prized game fish by many anglers. Burke Lake has produced large Walleye over the years with the largest ever sampled at 10 pounds. Anglers have consistently caught Walleye in the 4-7 pound range over the last few years and are encouraged to try trolling deep diving, crank baits and spinner rigs off deep water break lines and points adjacent to deep water. Anglers may also try a variety of soft

plastic grubs on jig heads and slowly bounce them off the bottom. Walleye and most other fish stay above the thermocline (usually less than 10 feet) when Burke Lake stratifies during the summer. Serious anglers can try fishing Burke Lake at night when Walleye actively feed. There is a 5 per day 18" minimum size limit on Walleye in Burke Lake.

Northern Snakehead were illegally introduced into Burke Lake around 2014. Since the introduction, biologists continue to sample snakehead in an effort to learn more about the ecology and biology, food habits, growth, and behavior. Biologists have been monitoring the fish community very closely to see if impacts are occurring to the aquatic community. During recent nighttime Walleye surveys, snakehead CPUEs of 5, 4, and 3 fish/hr. However, snakehead catches were stable at higher rates during daytime community sampling (15, 13, and 17 fish/hr). All Northern Snakehead caught were removed from the lake, aged, and evaluated for food habits. Bluegill were the forage of choice, however the Bluegill population remains stable. Anglers targeting snakehead should fish very shallow near heavy vegetation and/or structure using weedless lures such as frogs. Often these fish will give away their position visually as they rise to the surface to gulp air, or roll and expose their back. During the spawning season you may spot their fry balls which adult snakeheads guard aggressively. Northern Snakehead are excellent table fare with numerous ways to prepare it. Anglers are strongly encouraged to harvest them, and it is illegal to possess a live snakehead (the fish must be dead before leaving the lake). Effective methods to kill the fish are removal of the head, gills arches or internal organs.

General regulations are posted at the parking area at Burke Lake and on the DWR website ([www.dwr.virginia.gov](http://www.dwr.virginia.gov)). Fishing is permitted 24 hours a day, and a boat ramp is available for anglers to use free of charge. In addition to boat access, there is ample shoreline for bank anglers and a public fishing pier. Fairfax County Parks and Recreation operates a

concession at the lake (open March – October) which offers boat rentals, live bait, fishing tackle, and snacks along with their own boat launch.

For more information about Burke Lake, please contact:

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