



Burke Lake Management Report

Popular Report

Federal Aid Project – F111R

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Robbie Willis, Assistant Fisheries Biologist

Virginia Department of Game and Inland Fisheries

1320 Belman Road

Fredericksburg, VA 22401

Burke Lake is a 218-acre Department owned fishing lake in Fairfax County within the boundaries of Burke Lake Park. The Virginia Department of Game and Inland Fisheries (VDGIF) 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, and Channel Catfish; however the lake also offers rather unconventional (for northern Virginia) Walleye and Muskellunge fisheries. The lake is stocked annually with Walleye, Muskellunge and Channel Catfish, while the other species are maintained through natural reproduction. Walleye 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, JMU was contracted to conduct a study on impoundments to evaluate nutrient budgets and assess the effectiveness of VDGIF'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 VDGIF impoundments fertilized acted as nutrient sinks with no export of nitrogen or phosphorous.

Burke Lake is sampled on a regular basis through electrofishing and trap netting 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. Trap netting is a passive sampling method that uses a net staked along the shore. It forms a chamber into which fish can easily enter, targeting species not as accessible to electrofishing such as Black Crappie and Muskellunge. Walleye 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.

DGIF 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. Most recently, an electrofishing sample was conducted in May 2018 and a trap net sample in March 2018. 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.

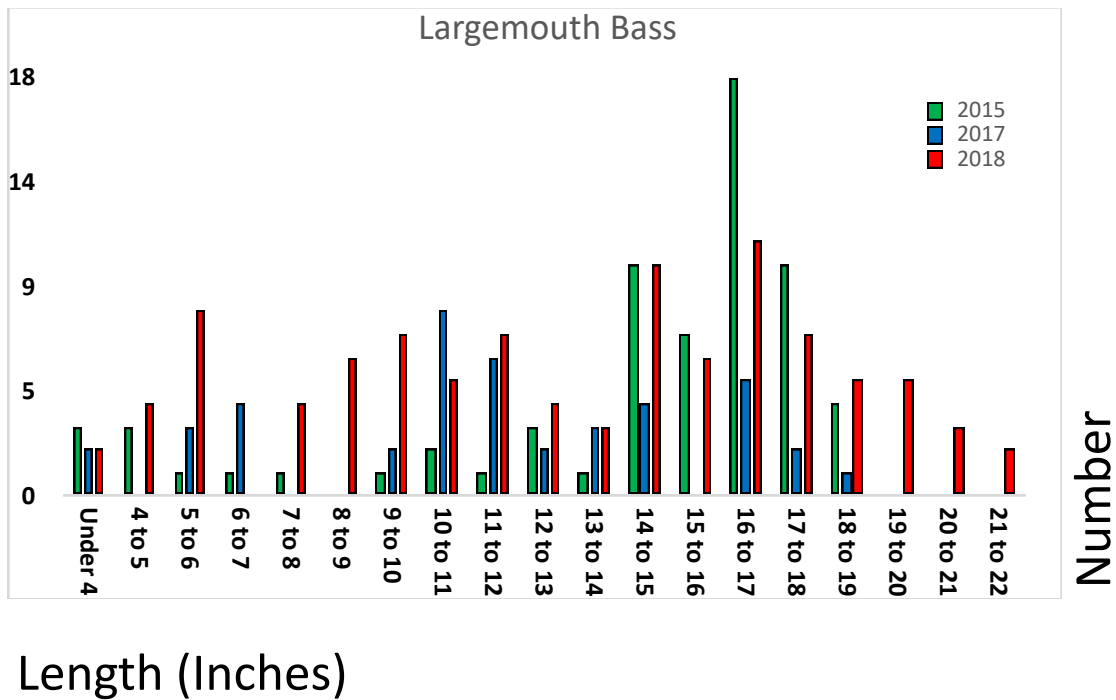
Largemouth Bass

The population size structure of Largemouth Bass in 2018 was slightly better than the previous sample in 2017. The 2017 Proportional Stock Density (PSD) value of 55 increased to 69 in 2018. 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") was 27 in the 2017 sample (which was good), but it increased to 51 in 2018 suggesting a shift in the population towards larger fish. Catch per unit effort (CPUE) of Largemouth Bass (42 fish/hour) in 2017 increased greatly in 2018 to 99 fish/hour. CPUE of preferred size bass was significantly greater in 2018 (42/hour) than in 2017 (9/hour) based on ANOVA ($P=0.003$). 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, with 6 pound bass available. Due to the combination of fishing pressure and abundant forage, Largemouth Bass can be difficult to catch at Burke Lake. Gizzard Shad are the primary forage for Largemouth Bass in Burke Lake. Anglers are encouraged to try different techniques, such as altering their retrieve, to improve their catch. 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 third in the district for

CPE-P. The term CPE-M is similar to CPE-P but only includes catch rates of bass over 20” and is more of an indication of true trophy potential. In 2018 the CPE-M was 5 indicating that there are plenty of large bass to be caught.

There is a 5 per day 12-inch minimum size limit on Largemouth Bass at Burke Lake. 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.

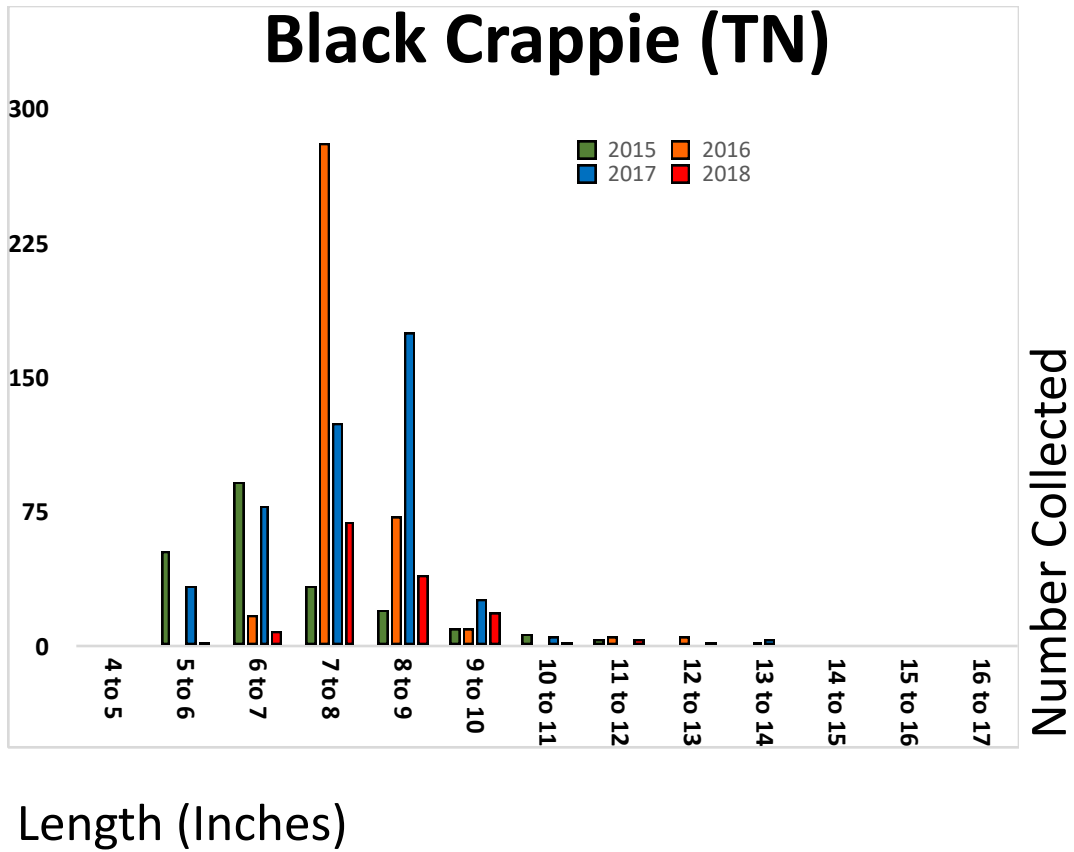
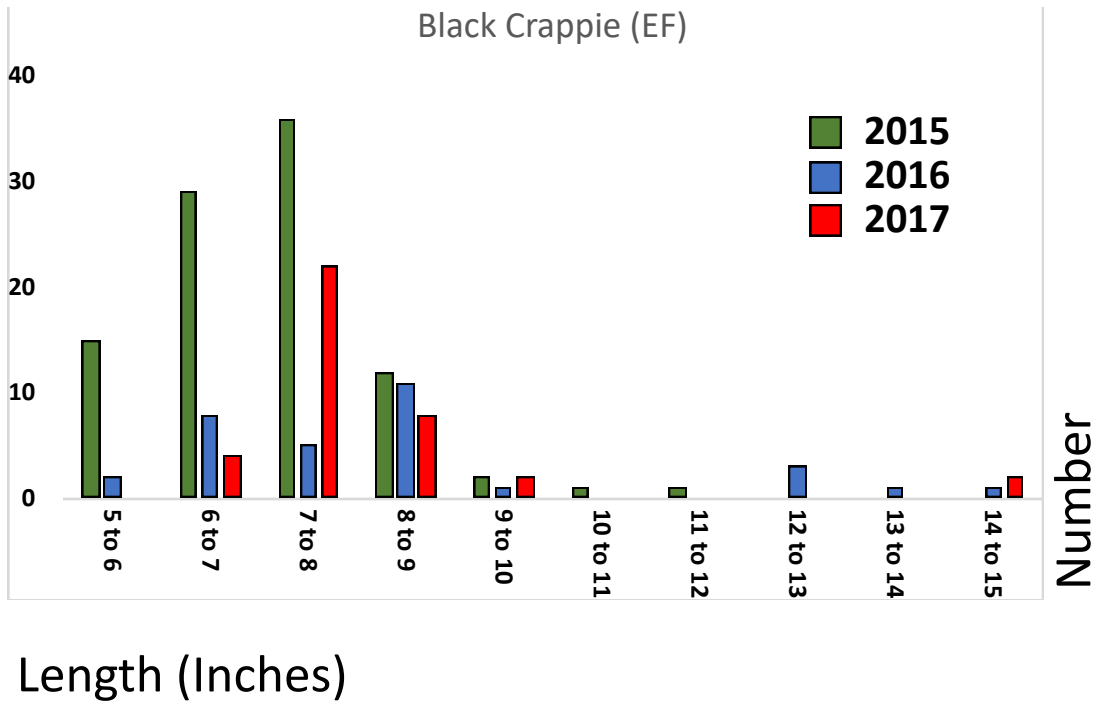


Black Crappie

Black Crappie (BLC) electrofishing CPUE was higher in 2018 (38 fish/hour) compared to 2017 (32 fish/hour). Burke Lake provides a decent Black Crappie fishery with numerous fish in the 6-9-inch range. The lake has produced fish in the 2-3 pound range with the lake record

crappie being 3.5 pounds. Proportional Stock Density (PSD) increased to 68 in 2018 from 59 in the previous year's sample. A PSD of value of 30-60 is indication of a balanced population. The PSD values suggest the population is comprised of larger fish. Crappie populations fluctuate due to high annual variation in spawning success. Trap nets are another sampling method used on Burke Lake. Catch rates while using trap nets are calculated in net nights (NN). The majority of crappie sampled were in the 6 to 9 inch range which mirrored electrofishing data. The 2017 sample produced a CPUE of 15/NN compared to 5/NN in 2018. Water temperatures in 2018 were the lowest in a decade due to a colder than average March which likely caused most fish to stay deep and reduced gear efficiency. Black Crappie are generally considered undesirable in small impoundments due to their ability to quickly overpopulate and stunt. However, Burke Lake is large and productive enough that stunting is not as much of an issue.

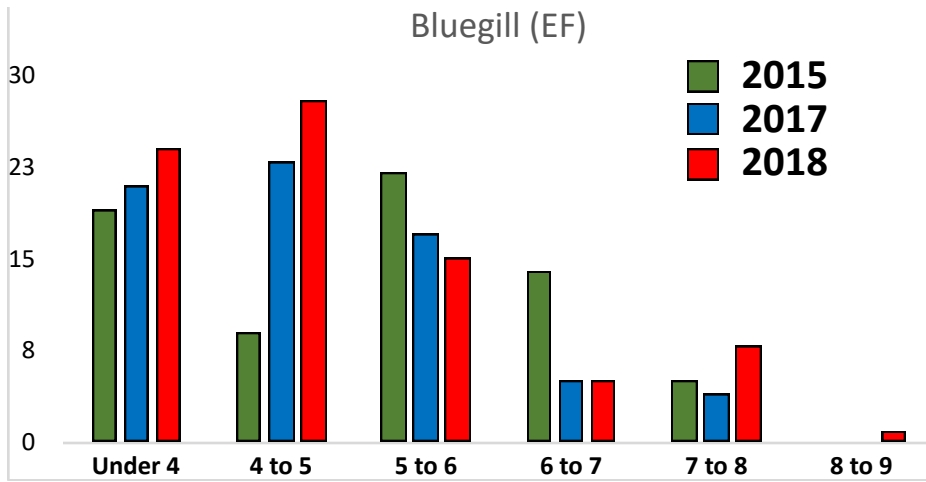
Anglers targeting crappie should focus on underwater structures and fish 6 to 8 feet deep. Anglers are encouraged to try fishing small crappie jigs, tubes, jig heads tipped with small minnows or Beetle Spins. Anglers are also encouraged to harvest any crappie caught up to the 25-fish/day creel limit. Crappie are readily available lake-wide from the spring to early summer months, and some larger fish are available up to 15 inches.



Panfish

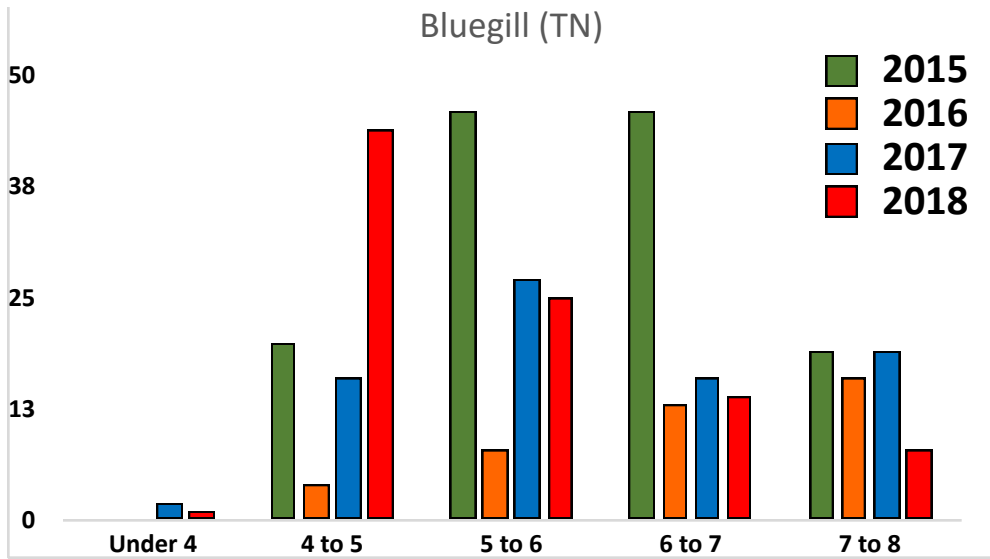
Bluegill electrofishing PSD was similar in 2018 (19) to 2017 (20) which suggests the population was balanced and stable. The 2017 CPUE of 70 fish/hour increased in 2018 to 81 fish/hour. Redear Sunfish PSD values were also similar between years (80 in 2017, and 72 in 2018), while CPUE increased from 2017 (5 fish/hour) to 2018 (18 fish/hour). Panfish fisheries are typically considered balanced when PSD falls in the range of 20 – 60. Trap net CPUE of Bluegill was 3/NN for 2017 and 2018 and similar to the electrofishing data with the majority of fish being 4 to 7 inches. Thus, these populations appeared stable.

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 in hopes of thinning the populations to allow for increased growth rates and eventually larger fish. Opportunities also exist to catch White and Yellow Perch at Burke Lake, and harvest of these species is highly encouraged.



Length (Inches)

Number Collected



Length (Inches)

Number Collected

Channel Catfish

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 a 21 lb. 8 oz. catfish 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

Muskellunge, more commonly referred to as Musky, are top predators in this impoundment. Muskies are normally stocked annually at a rate of 3 fish/acre. Trap nets were fished in March 2018 for a total of 30 net nights in an attempt to evaluate the Muskellunge population. Zero musky were collected during this survey, however 26 were observed during Walleye night electrofishing surveys assuring a stable population still exists. In 2017, seven Muskellunge were collected in trap nets with the largest being 40". Colder than normal water temperatures (low to mid 40's) in 2018 most likely played a role in keeping the fish deeper and not vulnerable to nets. There is a 30-inch minimum size limit on musky in 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

Walleye were initially stocked in 1979 to provide a diversified fishery and are typically stocked annually at 100/acre to maintain the fishery. Burke Lake received 150/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. A total of 83 walleye were collected for an above average catch rate of 13 fish/hour (the goal for small impoundments is ≥ 10 fish/hour). Spring trap netting resulted in the collection of an additional 19 Walleye. The population exhibited good size structure with fish up to 25 inches. 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 with the lake record 8 lb. 12 oz. Anglers are encouraged to try trolling deep diving, crank baits and spinner rigs off deep water break lines and points adjacent to deep water. Anglers could also try a variety of soft plastic grubs on jig heads and slowly jig them over the bottom. Anglers should also remember that Burke Lake stratifies during the summer; Walleye and most other fish stay above the thermocline (usually less than 10 feet) during this time. 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

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 Walleye surveys at night over the past 4 years snakehead CPUE was 0.2, 0.7, 1.3 and 2.4 which suggested an increasing trend in abundance. However, snakehead CPUE was stable over the last 4 years during daytime community sampling (catch rates of 4, 0, 1 and 3 fish per hour). All Northern Snakehead caught were removed from the lake, aged, and evaluated for food habits. Bluegill were the forage of choice, but to this point the Bluegill population has remained 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 a very good eating fish, and there are numerous ways to prepare it. Anglers are encouraged to harvest all Northern Snakeheads; 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 DGIF website (www.dgif.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:

Virginia Department of Game and Inland Fisheries

1320 Belman Road

Fredericksburg, VA 22401

540-899-4169

Burke Lake Park

7315 Ox Road

Fairfax Station, VA 22039

703-323-6601