



## Lake Shenandoah 2009

Lake Shenandoah is a 36 acre impoundment owned by the Department of Game and Inland Fisheries. The lake is located in Rockingham County near the City of Harrisonburg. Urban development surrounds much of the lake and is the dominant land use of the entire watershed. Much of the lake is shallow (<3 ft.) and the maximum depth near the dam is 25 feet. Anglers have the opportunity to catch largemouth bass, bluegill, black crappie, common carp, channel catfish and musky from Lake Shenandoah.

Throughout its history Lake Shenandoah has had chronic fisheries problems that can be attributed directly to development in the drainage. A public golf course and expanding residential development have introduced excessive nutrients and sediments to Lake Shenandoah. The result has been severe negative impacts on fish habitat. In the 1970's and 80's submerged aquatic vegetation was a severe problem, and DGIF biologists battled the weeds with various treatments. In the 1990's the vegetation was subdued, but then the excessive nutrients were made more available and caused profound planktonic algal blooms altering water quality. Respiring algae caused all the water in the lake except the upper few feet below the surface to become void of dissolved oxygen during the summer months. Low oxygen levels can suppress aquatic insect populations and stress fish. However, in recent years, dry spring weather has kept the lake water clear and the submerged vegetation is again causing problems. This aquatic vegetation not only makes fishing difficult, but it provides small sunfish refuge from predators and the can easily overpopulate. In addition, shallow water in the upper two arms of the lake, with freshly deposited sediments, creates poor physical habitat for all fish species and encourages weed growth. Overpopulated bluegill and crappie then compete with young bass and catfish for the limited food supply causing poor growth for all fish species.

Currently, biologists are looking into ways to renovate Lake Shenandoah by creating suitable habitat for a healthy fish population.

### **Status of Fishery**

The most recent fish population survey conducted on this Department-owned reservoir by biologists was a night-time electrofishing survey in spring 2008. Biologist sampled fish using electricity around the perimeter of the reservoir. Two-hundred-thirty-six (236) largemouth bass were collected with the majority being <12 inches in length. Several quality sized bass > 18 inches were also sampled (Figure 1.) While the electrofishing catch rate of largemouth bass is exceptionally high (312 fish / hour), bass recruitment appears to be inconsistent. Severe competition between small sunfish, crappie and young largemouth bass is the most likely culprit in poor bass recruitment into the fishery. However, once bass "break through" from directly competing with small

sunfish for food and habitat resources they grow quickly. Limited spawning substrate and influx of sediment may also be limiting bass reproduction. Vast amounts of submerged aquatic vegetation were present in Lake Shenandoah in 2007 and 2008. This vegetation not only made it difficult for anglers to fish, it also provided too many hiding places for small sunfish and crappie. When predators like largemouth bass and musky cannot effectively forage on these small sunfish, the sunfish can overpopulate and grow more slowly. In turn, the predators cannot feed as easily and they also don't grow as they should. Having to endure poor habitat and water quality conditions, the largemouth bass population is holding its own in Lake Shenandoah. In 2009, the concessions operator at Lake Shenandoah reported poor angler success for largemouth bass and DGIF biologists also received numerous negative fishing reports. DGIF plans to aggressively control the aquatic vegetation in 2009 (and beyond) and hopefully the fishery and angler success will improve.

In the 1980's and 1990's sunfish and black crappie were overcrowded and stunted in the reservoir. This condition still exists in Lake Shenandoah. With few fish over 6" and a whopping electrofishing catch rate of 493 fish per hour, bluegill are still overpopulated in Lake Shenandoah (Figure 2). Biologists usually encounter large numbers of small crappie at Lake Shenandoah. However, in 2008 we had a difficult time capturing crappie. DGIF's electrofishing catch rate was extremely low and few fish >10" were collected (Figure 3.) The unbelievably slow grow of crappie, where almost all crappie are not reaches 10 inches even after up to 10 years, is proof that the fish are crowded and overpopulated (Figure 4). Protecting predators, like largemouth bass, with an 18" minimum size limit, stocking muskellunge, and encouraging liberal harvest of panfish are ways that biologists are trying to improve the sunfish/crappie population. Reducing the amount aquatic vegetation should also help restructure the sunfish and crappie population by allowing predators better access to these forage fish.

Recent changes in the channel catfish stocking program appeared to be working in Lake Shenandoah. Increasing the stocked sized of catfish from 4-5" to 8-12", biologist and anglers alike were seeing good numbers of catfish in the 15-20" range in 2006-07. However, biologists did not collect many and anglers reported very low catch rates in 2008. Hopefully 2008 was only a "down" year for catfish and angler catch rates will increase in the future. The reservoir will continue to be stocked annually with channel catfish.

Lake Shenandoah has always been known for its muskie population and anglers targeting these "toothy" critters are doing well. The lake is stocked annually with fingerling muskellunge and they grow rapidly. Legal -sized fish (30"+) are regularly caught by anglers all months of the year, and biologist routinely "roll" a hefty muskie or two while electrofishing. Fish pushing 50+ inches have been reported by anglers and the lake Concessionaire in recent years.

The reservoir also has a dense population of common carp. Some of these individuals can grow up to 15+ pounds. Carp are often overlooked by anglers and considered a "trash" fish. However, they are revered as a sportfish across the rest of the world, are difficult to catch, and fight as well as any of the other game fish in the reservoir. Give carp fishing a try on your next outing to Lake Shenandoah!

Overall the fishery at Lake Shenandoah is suppressed by abiotic and biotic factors. The size structure of the panfish population is skewed toward smaller fish and recruitment of largemouth bass is inconsistent. However, there are some quality size fish found in the reservoir, and biologists are working toward improving the fishery.

Prepared by: Steve Reeser, District Fisheries Biologist with the Virginia department of Game and Inland Fisheries: (540) 248-9360; [steve.reeser@dgif.virginia.gov](mailto:steve.reeser@dgif.virginia.gov)

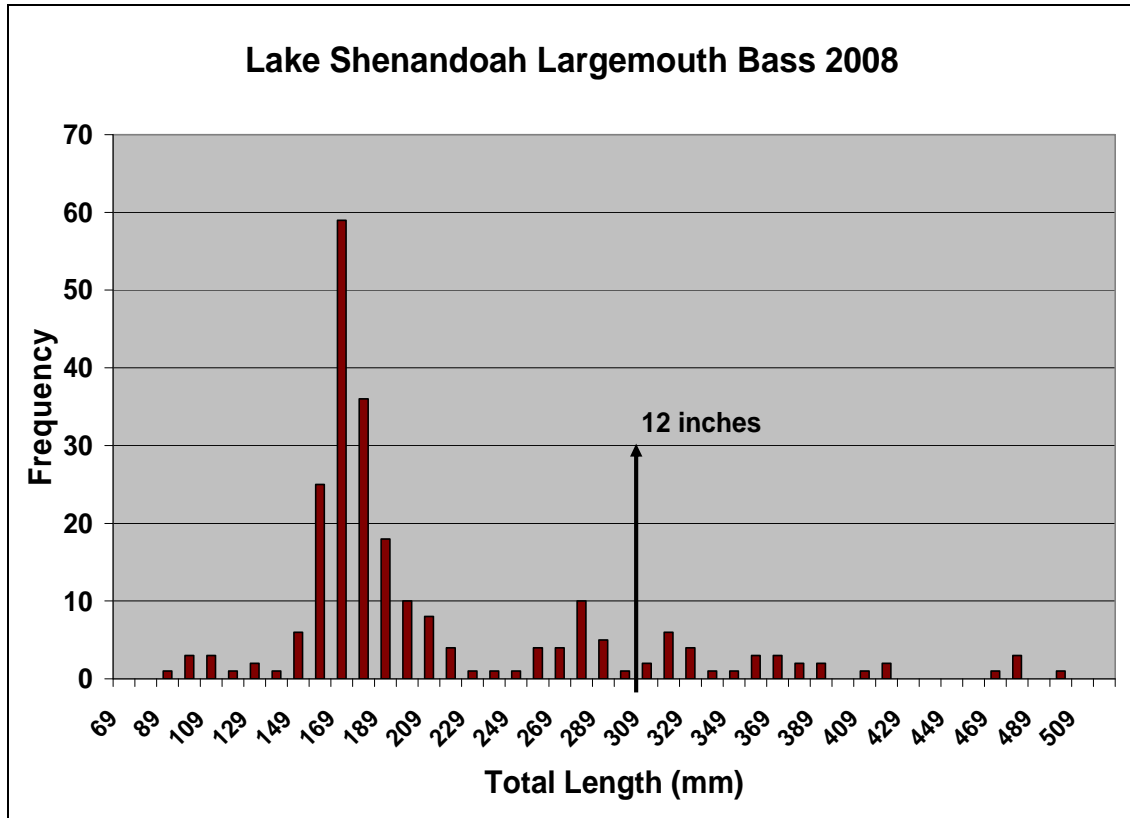


Figure 1. Length frequency of largemouth bass collected in spring 2008 electrofishing sample.

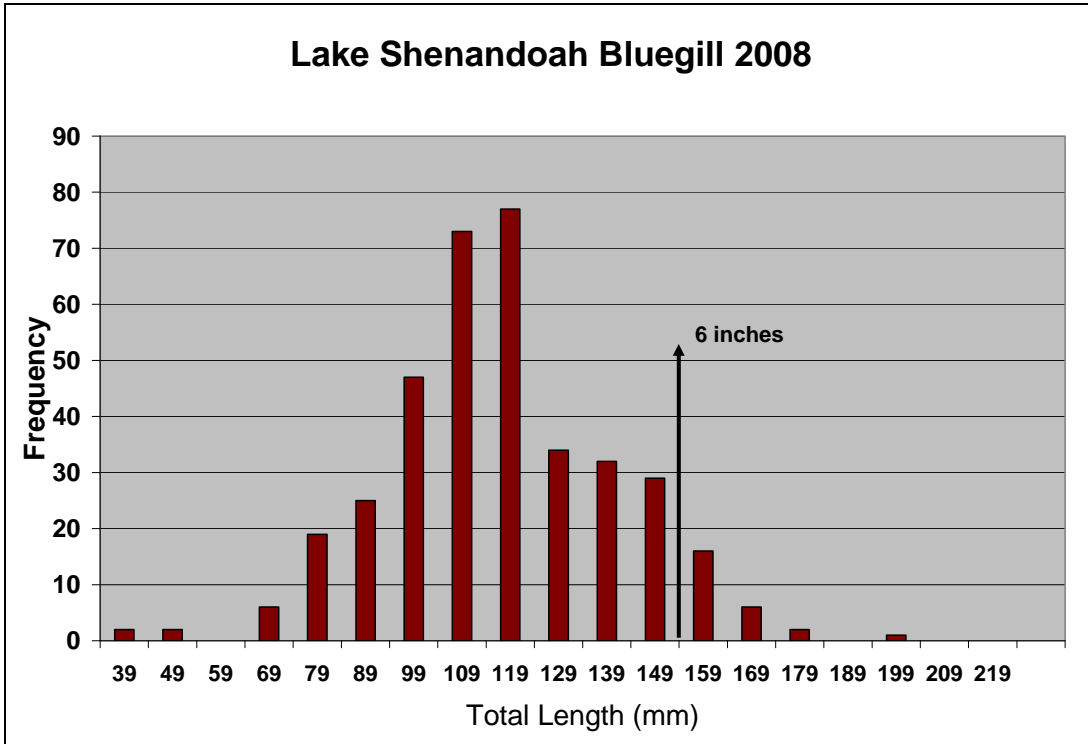


Figure 2. Length frequency of bluegill collected in spring 2008 electrofishing sample.

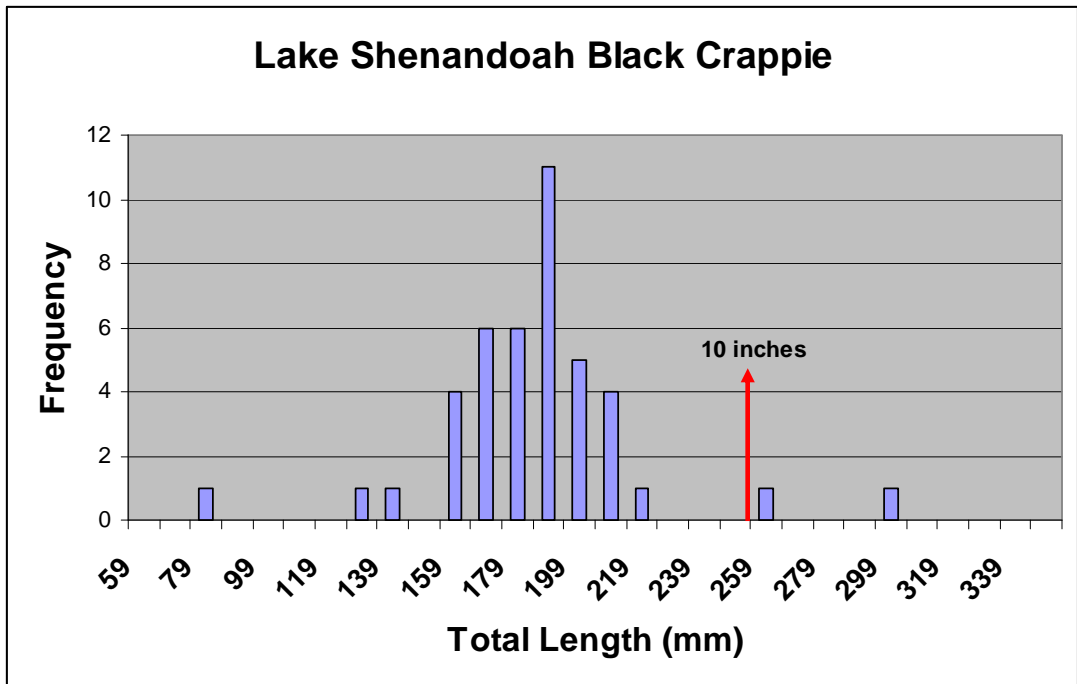


Figure 3. Length frequency of black crappie collected in spring 2008 electrofishing sample.

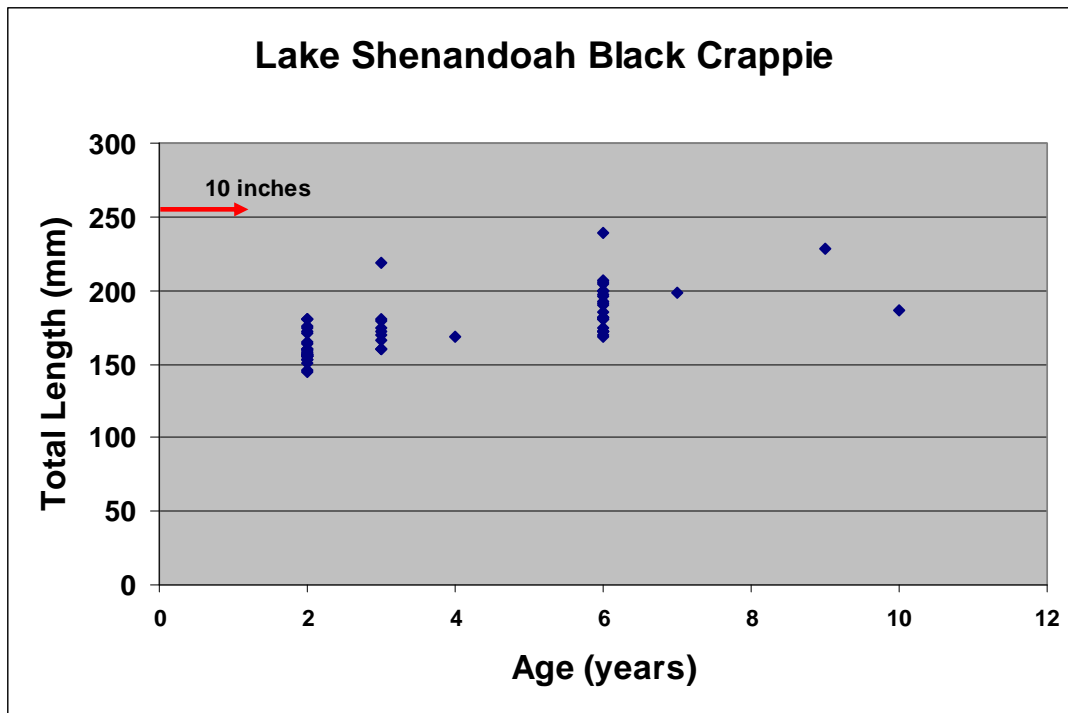


Figure 4. Black crappie growth rates 2008.