



The Recovery of Cheat Lake

A Success Story

By Frank Jernejcic and Dave Wellman

For most people, their first and only view of Cheat Lake occurs while crossing the Interstate 68 bridge east of Morgantown. Most interstate travelers do not realize that the majority of the picturesque lake's 1,730 acres lie out of sight north of the bridge. Only four other lakes in the Mountain State are larger. The maximum depth is about 90 feet near the dam, while the depth under the I-68 bridge is eight to 20 feet.

Historically, water quality throughout the Cheat River watershed has been negatively impacted by acid mine drainage (AMD) and Cheat Lake has served as a catch basin for highly acidic water. Cheat Lake is recovering from 80 years of AMD impacts, and anglers are experiencing the rebirth of a fishery. Acid mine pollution has reduced the productivity of the

lake and its fish populations ever since this man-made impoundment was created. Various fishery surveys in the lake throughout the years revealed a meager fish population characteristic of waters severely impacted by AMD. As a result, biologists did not attempt fishery management activities in the lake until the early 1990s.

Concerned citizens formed The Friends of the Cheat (FOC) watershed group in the spring of 1994 in response to a significant AMD blowout from an underground coal mine that had been closed recently. The founders immediately recognized that the scope of the AMD problem in the watershed extended far beyond this single catastrophe, and that all available resources would need to be coordinated to achieve a solution. Consequently, their efforts led to the formation in 1995 of the River of Promise (ROP) task

force composed of local, state and federal government agencies, private industry, academia, and conservation organizations. Meeting quarterly and chaired by FOC members, the ROP task force initiates, monitors and coordinates AMD remediation projects throughout the watershed.

Cheat Lake dam was constructed in 1926 by the West Penn Power Company to produce electricity by hydropower. It has no flood control capability. The dam is located seven miles north of the I-68 bridge and only 100 feet from the Pennsylvania state line in Monongalia County. The company named the new impoundment Lake Lynn, but most people refer to the project as Cheat Lake. Environmental issues were not important concerns when the project was designed in the early 1920s. Consequently, provisions for downstream river flows and recreational use were not mandated by state or federal agencies.

Federal laws regulating hydropower development have since required that these projects not harm fish populations. Furthermore, fishing and other recreational opportunities must be improved if possible. To satisfy the new environmental requirements for relicensing the Cheat Lake hydropower project, power company consultants conducted extensive aquatic surveys on the lake and in the tailwater during 1990.

They collected 33 species of fish from Cheat Lake in 1990. This represented a substantial improvement from the 15 species collected in the mid-1950s. Additional evidence of improving fish populations came from a successful bass fishing tournament in 1990. Four bass tournaments held in 1992 produced

the third best catch rate of all West Virginia lakes. Something had definitely improved.

The Federal Energy Regulatory Commission subsequently issued a renewal license to Allegheny Energy Supply (AES) for the Lake Lynn Project in 1994 for a term of 30 years. This new license

agreement required a biomonitoring study of the aquatic resources in the lake and in the Cheat River downstream. The Commission also mandated two changes in the operation of the dam to improve water quality, fish populations and boating recreation.

The first major change implemented a minimum flow release of 212 cubic feet per second (cfs) from the dam to mitigate poor water quality in the river downstream from the project. No minimum flow was required prior to 1994 when a zero discharge could, and often did, occur. The minimum flow buffered acidic tributaries entering Cheat River downstream of the project.

This allowed upstream movement of fish from the Monongahela River and provided anglers a tailwater fishery. A second change in the operation of the dam specified certain lake levels that had to be maintained throughout the year. The summer pool elevation must be held between 868 and 870 feet (above sea level) from May through October to increase fish spawning success and enhance recreation. Elevations can fluctuate between 857 and 870 feet from November through March to maximize power production, but only between 863 and 870 feet during April to improve walleye and yellow perch spawning success. The maximum Cheat Lake fluctuation of 13 feet is minimal when compared to most of West Virginia's other large



A trophy-size smallmouth bass caught in Cheat Lake.
Dave Wellman / WV DNR

Fishery surveys conducted from 1997 to 2009 collected a total of 46 species and revealed a significant increase in both sport fishes and forage fishes in the lake since the 1990 study.



Above, boats are launched in preparation for a bass tournament in Cheat Lake. Right, contestants line up for weigh-in with their catches.



Frank Jernajcic / WV DNR

impoundments that are operated by the U.S. Army Corps of Engineers for flood control purposes.

A partnership between AES, the West Virginia Division of Natural Resources (DNR), and the Pennsylvania Fish and Boat Commission (PFBC) was created to monitor the aquatic resources and water quality as related to project operations in the lake and downstream in Pennsylvania. Various fishery and water quality surveys, funded by AES, were conducted annually from 1997 through 2009 to evaluate different aspects of the fishery resource that might be affected by hydropower operations. Fisheries biologists gleaned several conclusions from these surveys.

Fishery surveys conducted from 1997 to 2009 collected a total of 46 species and revealed a significant increase in both sport fishes and forage fishes in the lake since the 1990 study. Most notable were the increases in channel catfish, largemouth, smallmouth and spotted bass, walleye, and white bass. Golden redhorse suckers also increased significantly. Adult gizzard shad numbers remained constant. They are reproducing successfully but predation is obviously keeping their numbers low.

DNR Wildlife Resources Section personnel have put a lot of effort into creating a walleye fishery in

Cheat Lake. The increase in walleye abundance can be attributed to stockings in 1999, 2000, 2004–2007, and 2010. Stocking was not conducted in 2008, and walleyes 8–10 inches long, which would indicate successful natural reproduction, were not collected in fall 2008 as they had in previous years that followed stockings. Frequent storms during April and May of 2008 caused turbid water conditions that may have reduced spawning success, egg survival, or availability of food for walleye fry. The 2010 stocking was the largest yet and coincided with good water conditions. This should produce good numbers of 15-inch fish for anglers in 2012 and should contribute to the reproducing population during the next three to five years. A 15-inch walleye will be two or three years old while a 20-inch fish would be four or five years old.

During the most recent Wildlife Resources Section fishery surveys, fewer 10- to 13-inch yellow perch were collected than in previous years. This is consistent with angler reports that smaller and fewer yellow perch have been caught over the last couple of years than in the golden year of 2005 when large yellow perch were common. Yellow perch populations, as well as walleye populations, are cyclical and are greatly influenced by environmental conditions such as high, muddy

water. Often the number of yellow perch and walleyes available to anglers are dependent on one or two successful reproductive years every five to 10 years. A daily creel limit of 15 perch was enacted in 2007 in response to high angler harvest rates in 2005 and will spread out the catch during years of abundance. The age of 11-inch perch ranged from 5 to 11 years old.

The channel catfish population has increased in number and size. Three-pound fish are common and a nine-pound fish was the largest reported in 2010. Hardy anglers can catch catfish from the fishing piers at the Cheat Lake Park throughout the winter when the lake is not covered with ice. This is probably the best channel catfish fishery in any of our large impoundments.

Smallmouth bass numbers have increased throughout the lake while largemouth bass are most abundant in the embayments. The percentage of smallmouths caught during bass tournaments has also increased. In fact, Cheat Lake has become one of the best lakes in the state for bass tournaments. The number of bass tournaments has increased from one in 1990 to an average of 30 tournaments held annually since 2005. During 2008, Cheat Lake bass anglers experienced the highest success rates among 21 major West Virginia tournament waters. Bass tournament fishing activity is one of the best indicators of the recovered Cheat Lake fishery.

DNR water quality analysis has indicated that during periods of low river flow and warm temperatures, specifically during summer and early fall, dissolved oxygen can be limited in deeper parts of the lake. These conditions are common throughout West Virginia lakes and typically do not adversely affect fish populations.

As mentioned previously, however, the improved water quality has been the direct result of AMD treatment upstream of Cheat Lake. To document this improvement, DNR, in cooperation with Allegheny

When built, the Lake Lynn power house and dam reflected the state of the art in American hydroelectric power technology and developed a



Jet Lowe/HAER

very substantial portion of West Virginia's hydrologic resources. This utility helped provide electricity to much of northern West Virginia and southwestern Pennsylvania and encouraged economic development in these areas. The reservoir created by the dam also permits the Monongahela River (into which the Cheat River flows) to run normally during dry, late summer months.



Energy Supply and the West Virginia Department of Environmental Protection (DEP), have been monitoring water quality entering Cheat Lake since 2004. During this period, pH values, a common indicator of AMD, have generally been greater than 6.0, which is the minimum required for a healthy fishery.

Unfortunately, events in May 2009, and to a lesser extent in November 2009, illustrate Cheat Lake's continued vulnerability to AMD inflows. The pH throughout Cheat Lake fell below 6.0 while Cheat River entering the lake experienced pH values less than 6.0 for almost the entire month of May. The pH depressions indicated that acid sources from mine drainage and/or acid precipitation still negatively impact



Dave Wellman / WV DNR



Dave Wellman / WV DNR

Author holds a largemouth bass, above, and a yellow perch, right, caught during separate fish surveys.



Frank Jernejcic / WV DNR

The orange coloring of Muddy Creek in Preston County 14 miles above Cheat Lake indicates acid mine drainage.



Steve Brown / WV DNR

Limestone sands dumped into tributaries of the Cheat River help neutralize acidic waters in the stream and in the lake downstream.



Steve Shaluta / WV Dept. of Commerce

Cheat Lake. Fortunately, no dead fish were observed during these events, nor was fishing obviously affected. The lake's large volume of good quality water was able to dilute the lower quality inflow during those events.

The continued recovery of Cheat Lake fish populations and the development of a new tailwater fishery are dependent upon the maintenance of good water quality in the lake. The recent water quality improvements are related to a reduction of acid mine drainage entering the lake. The cause of such a reduction has not been documented, so it is not certain if the situation is permanent. Fish populations and water quality will be monitored in the lake and in the Cheat River above and below the lake to determine the future of fishing in these waters. West Virginia's anglers are optimistic that the future of fishing in Cheat Lake will remain positive.

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