



Tenkiller Lake

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT

BUILDING STRONG

Tenkiller Lake Downstream Trout Fisheries

- **Tenkiller Lake was congressionally authorized for flood control, water supply, hydropower, recreation, and fish and wildlife. The normal pool – the conservation pool – includes storage for water supply and for hydropower. All of Tenkiller Lake’s water supply storage has been contracted for and committed to various municipal and industrial water users, including communities, rural water districts, and others. In addition, Southwestern Power Administration utilizes the hydropower storage for hydropower generation. There is no storage allocated for the project purpose of recreation and fish and wildlife.**
- **Some releases from the dam are controlled by sluice gates. Over time, the seals on those gates have deteriorated, causing leakage downstream. The Corps is in the process of repairing the sluice gate seals. We believe those repairs will prevent or decrease the leakage, allowing the conservation pool user’s maximum use of the storage available to them, and reduce further deterioration of the gate seals.**
- **The trout fishery has historically benefitted from the leakage from the sluice gate and has been negatively impacted by the repair process.**
- **In the past few years, Sequoyah Fuels utilized part of their contracted storage for releases downstream. Those releases contributed to the fishery in the lower Illinois. However, that contract has expired.**
- **Storage for the downstream fishery has also been donated recently by Sequoyah County Water Association and Tenkiller Utilities Authority.**
- **Unfortunately Oklahoma, Texas, Kansas and parts of Arkansas are experiencing severe drought conditions. Many lakes in the area are well below normal capacity.**
- **The Corps is monitoring the drought and we work very closely with other local, state, and federal agencies and our stakeholders during a drought to meet their needs and resolve any situations that may develop.**
- **Our projects are designed to handle drought situations and they are performing as authorized and designed.**

- **The Corps has been working with State and Federal and other entities to explore possible short and long term solutions, such as:**

Short term

- **Use of donated Tenkiller storage to the downstream trout fishery**
- **Complete sluice gate repairs so that water, when available, can be released there instead of through the turbines.**
- **Request revision to dam safety classification to “low risk” so temporary or permanent pool rise can be considered.**
- **Continue to look for mechanical alternatives to increase dissolved oxygen levels in refuge pools below the sluice gates.**

Mid-term

- **Consider seasonal pool for summer 2012. Implement mechanical measures to increase dissolved oxygen and other potential beneficial downstream modifications.**
- **Perform Section 216 “Initial Appraisal” to evaluate project performance and best use.**

Long term

- **Budget for Reallocation Study to recommend best use of Tenkiller storage: Flood Risk Management, Hydropower, Water Supply, Recreation, Fish and Wildlife (downstream environmental minimum flows).**

Questions and Answers

Q: What is the current status of conditions at Lake Tenkiller which affect the Lower Illinois River?

A: Notification was made to Oklahoma Water Resources Board, Oklahoma Wildlife Conservation, United States Fish and Wildlife, Environmental Protection Agency, and congressional offices regarding the Lower Illinois River fishery. Conditions this week improved due two positive events at Lake Tenkiller. Recent rains and associated runoff have resulted in Lake Tenkiller conservation pool reaching normal levels, resetting water storage allocations for all water supply contract holders, including the Oklahoma Department of Wildlife Conservation's (ODWC) donated storage from 19 October 2011 to 17 January 2012. Once again, ODWC can order releases as needed for the downstream fishery. The downstream water quantity and quality is in good condition and Oklahoma Department of Wildlife will resume the trout stocking.

Q. Why can't you use your authority to release enough water to prevent fish kills?

A: Tenkiller storage was authorized, and built for the purposes of water supply, hydropower and flood control. All the water supply storage has been contracted for and the Southwestern Power Administration makes full use of the hydropower storage, leaving no conservation storage for any other purposes.

Q. What is meant by full use of SWPA storage? Do they use 100% of their 93% of water every month/year?

A. The water supply users and Southwestern Power have not completely exhausted their storage in the past. Tenkiller Lake's hydropower usage is based on an unpredictable quick response to peak electrical needs. Therefore the stored water could be called upon on very short notice to prevent shortages of electricity. Hydropower and other authorized users decide when to use their allocations.

Q: Is there a way to get a reallocation of the water for releases to prevent fish kills?

A: Before any substantial reallocation of storage, federal law requires detailed analyses of any proposed reallocation of storage in Corps of Engineers reservoirs. The analysis includes economic, engineering and environmental studies to address the impact of the reallocation on all project purposes. In most cases, US Congress must authorize and fund any reallocation studies, along with the reallocation itself. In addition, the reallocation has to comply with other federal laws as well, and studies must take those laws into account. Even after that process, storage for a downstream fishery may or may not be identified as the best use for the storage.

Q. Has the Corps/SWPA not kept records that will expedite the reallocation process and show that the leakage has not impacted the current storage?

A. Leakage has impacted the storage allocations by leaking approximately 21,900 acre-feet on an annual basis. Although reservoir data has been kept since operation of the lake began, the reallocation process must undergo multiple steps. The data available is only part of the overall study.

Q: Why has this become an issue?

A: This has become an issue for several reasons. First, the process to repair the sluice gates has prevented downstream leakage which was beneficial to the trout fishery. Second, the repair of the sluice gates has also temporarily prevented a more beneficial method of release

of water from donated storage – the release must be made through the hydropower units which does not provide as high of dissolved oxygen level. And third, the drought and extremely high temperatures experienced this summer have severely impacted stream flow and has decreased the amount of water available from the donated water supply storage and added to fish stress issues. **(Update – Recent rains have refilled all water supply users’ storage allocations. This extends the former Sequoyia Fuels donated water releases for the below dam fisheries.)**

Q. Have stream flows and fish been as severely impacted by high temperatures and drought this year as in past summers?

A. The impact for this year’s drought has been the most severe since the fishery was created. The National Weather Service identified July 2011 as the hottest month in Oklahoma’s recorded history. The drought was classified as “exceptional” and “extreme” for much of Oklahoma by the U.S. Drought Monitor.

Q: How are Tulsa area lakes being affected by the drought?

A: Many if not all Tulsa area lakes have been impacted by the drought. Recreation use at the lakes has been impacted and, many water supply users have been put on notice that the storage available to them was, until recent rains, being rapidly depleted and they were encouraged to consider implementing contingency plans in case their storage is no longer available. These lakes have many congressionally authorized purposes including water supply storage and at some lakes, hydropower. Managing the lakes is a balancing act in order to meet all of these purposes and during a drought, it’s very important to maintain constant communication with our local, state, and federal agency partners, all of our stakeholders and the public to inform them of the effects that the drought will have and to find solutions to issues that may arise. This drought is affecting our entire district and we working with our partners to make responsible decisions as to how we manage the lakes.

Q: What happens if the drought gets worse?

A: Each Corps of Engineers project has a drought contingency plan in place which provides a basic reference for water management decisions during a water shortage induced by drought. There are four levels of response which are progressively initiated as the drought gets worse. These plans are project specific and designed to address various issues such as hydropower and water supply throughout the drought. Also, the Corps activates our drought management committee, which is a team of multi-disciplined Corps professionals in our district that can review each project’s status and any requests for assistance. We also activated the Oklahoma and Kansas Interagency Drought Management Committees, which are multi-agency committees that meet to address drought related issues. These are just a few things that we do when we’re in a drought situation, the most important thing to remember is that we have plans in place for droughts and we work closely with all impacted agencies, stakeholders and the public during a drought situation.

Q: What is happening with the trout fishery below Tenkiller Dam?

A: We recognize that the trout fishery on the lower Illinois River is considered an important resource for many area residents and visitors. The Tulsa District manages the storage of water in Tenkiller Lake in accordance with its congressionally authorized project purposes, which include flood control, hydropower generation, water supply, recreation and fish and wildlife. Storage within the reservoir is allocated for these various purposes in compliance with federal laws and regulations. However, current law provides no storage allocation for the specific purposes of recreation and fish and wildlife, downstream flows, or management of the trout fishery. Up until this point, a temporary agreement first, Sequoyah Fuels and

later Sequoyah County Water Association, Tenkiller Utilities Authority and the State of Oklahoma has allowed releases to be made from the dam to support the fishery.

Q: What are the agencies doing to minimize impacts?

A: Representatives from the Corps, U.S. Fish and Wildlife Service, Oklahoma Dept. of Wildlife Conservation and Southwestern Power Administration met to address the situation. A multi-agency effort is ongoing and we are vigorously exploring other options to extend the use of the remaining water. All agencies are working to find a long term solution to the problem.

Q: What are the short, mid and long term solutions for the fishery?

A: Long term solutions may include a seasonal pool plan (longer term but temporary) or review of congressionally authorized purposes, although no decisions have been made and all options are being explored. Midterm solutions might be consider a seasonal pool for 2012 and perform a Section 216 "Initial Appraisal" to evaluate project performance and best use. In the short term, use of donated Tenkiller storage complete sluice gate repairs so that water, when available, can be released there instead of through the turbines.

Q: How much water was leaking from the dam per year and how many years has it been leaking?

A: Tenkiller Dam was completed in 1952. As in any man made structure, age takes its toll. The leak gradually grew to over the course of a year a leak that would fill 21,900 acres one foot deep. This amount represents about 6percent of the total conservation pool.

Q: Isn't the top level of the conservation pool when the lake is at normal level approximately 13,500 acres one foot deep? If that is true, would not 18 inches be close to the value of the leakage? (18" divided by 12 months should equal approx... 1 1/2 inch per month drop if no rainfall.)

A. The analogy stated is fairly accurate. However, it assumes no water supply or hydropower use. Keep in mind, the lake will also evaporate an additional 5-6 feet in an average year.

Q: How was it able to leak for the past 25 years plus and not have a devastating effect on the conservation pool?

A: In the recent past, there has been enough rainfall to resupply the lake's storage. However, the storage must be sufficient to last during a multi-year drought. Should the Illinois River Basin undergo a prolonged multi-year drought as in 1954 -1956, the loss of 21,900 acre-feet from leakage per year would impact all the storage users.

Q: Whose allocation did the leakage come from?

A: Losses through leakage or evaporation, as an example, are distributed to each storage user based on their portion of the total contracted storage. (Therefore Southwestern Power has the greatest loss).

Q: How many times in the history of the dam has SWPA not been able to generate or there was mandatory rationing to the water rights holders (like in 2006 when the lake was approx. 12 ft low)?

A: The water storage holders, including Southwestern Power, have not fully consumed their storage allocations in the past. The Corps sells water storage to individual users and any rationing or reduced marketing is at the discretion of those users. Users are given notice of storage remaining by the Corps if their storage is less than approximately 75%. The conservation pool, of Tenkiller Lake, or any storage lake, is designed to be completely consumed while meeting user demands during a critical drought.

Q: What criteria does the Corps use to determine users remaining allocation has reached 75 percent?

A: All users have 100% of their allocation at full conservation pool (632.0). When the conservation pool reaches 75 percent, or 624.4 level, users are notified of the level in order for them to prepare for conservation measures. When the lake rises back to 632.0 or above from new inflow the storages are all considered 100% full again.

Q: Of the 93 percent of the conservation pool allocated to SWPA, what is the maximum percentage they have ever used on a monthly and yearly basis?

A: Under normal conditions when there is adequate inflow of water to the lake, accounting of usage is on the honor system. Individual contract use accounting is done only during times of drought when the storage level goes below 50% of normal pool.

Q: In the history of the lake, what is the greatest percentage below normal has the pool ever been?

A: In October 1954, during a drought period, the pool gradually fell to 599.0 or 91 percent of the conservation pool empty.

Q: Who makes the call to release water thru the sluice tube and what criteria are used to determine when it can be released?

A: Conduit (Sluice tube) and Tainter Gate Releases can be made for the purpose of flood control pool evacuation, as in the spring of 2011, and when the pool is above elevation 632. Hydropower releases are made when called for by Southwestern Power Administration.

Q: Does SWPA have the authority to allow a small flow thru a bypass piping system or bleed thru of a turbine if they chose to?

A: Water Supply and Hydropower storage users can request and schedule reasonable releases through the turbines or conduit if they have storage remaining and if Corps operations are not impacted.

Q: Why can't we get the amount equal to the leakage to start flowing now?

A: Although the trout fishery currently has no allocated storage, we are releasing water to the trout fishery at OWRB's request from the stored water that formerly belonged to Sequoyah Fuels until the new storage contracts go into effect.

Q: What is the time frame for the new contracts to go into effect?

A: Because of the required higher authority approvals we are hopeful of attaining final contract signatures in about 24 months or less.

Additional Q&A from 11-15 questions

Q: What criteria is used to define a drought condition for a Corps of Engineers lake?

A: The Tulsa District uses several criteria to define drought. For the district as a whole we use the drought monitor which can be found at www.drought.unl.edu .

We have Drought Contingency Plans for our lakes that define drought levels as being Level 1 through Level 4. Level 1, specific to Tenkiller Lake, is when the lake is at or above elevation 622.80 (70 percent of conservation pool). Level 2 is from 50 -70 percent of conservation pool. Level 3 is from 30 -50 percent and Level 4 is below 30 percent.

Q. During drought conditions when can they generate power?

A. The water supply and power pool at Tenkiller Lake is from elevation 594.5-632.00. Users can use or request use of water between those limits as long as their individual storage is not depleted. Tulsa District monitors and accounts for storage usage when the lake is below 632.00.

Q. If the lake is at 632 in June, is that a normal condition?

A. Elevation 632.00 is the top of conservation pool. Tulsa District has completed a period of record analysis of pool elevation-duration data and historically the pool is at or above elevation 632.00 81% of the time during the month of June.

Q. Where can we go to find the records of past lake elevations?

A. You can visit the Tulsa District H&H website at www.swt-wc.usace.army.mil for information on any of our lakes. Specifically for Tenkiller Lake elevations historically you can go to www.swt-wc.usace.army.mil/TENKcharts.html On that page we have monthly charts with historical daily data from November 1994 to October 2011.

Q. Where can we go to find histories of the last 10 years of generator operations and outputs?

A. The page mentioned above will show power releases made daily for the same period (November 1994-October 2011). It does not show hourly power releases. SWPA may have historical hourly data.

Q. Is there a site where we can pull up the powerhouse schematics?

A. Powerhouse schematics cannot be provided due to security concerns.