

TVA River Neighbors



Navigation • Flood Control • Power Supply • Land Use • Water Supply • Water Quality • Recreation

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Recreation Use Study Under Way Taking the Pulse of the Public

It's time to head home after another fun day on the water. You've just finished pulling your boat up the ramp, and you're stowing the last of your gear when a friendly-looking person comes toward you with a clipboard. Regardless of what you might first suspect, you're not in for a sales pitch on a time-share vacation condo. It's your chance to tell TVA about your recreational experience: how often you spend time on or near the water, where you go, what you do, and how much money you usually spend.

Variations on this scenario are being repeated many times this summer and in many locations throughout the Valley. It's all part of a new Recreation Use and Economic Effects Study—part of a larger effort by TVA to learn more about how citizens use the Tennessee River system and how they might be affected by possible changes to TVA's reservoir operating policies.

TVA is in the process of identifying alternatives for operating the river system as part of a two-year Reservoir Operations Study (ROS). The information col-

lected in interviews with recreation users will be used in determining which operating alternatives might result in greater value to the public.

TVA Recreation Specialist George Humphrey is leading the data-gathering process, which is being conducted by private consultants. "We haven't had new information on this subject at this scale since 1978. This is going to give us a more accurate picture of recreational use of the TVA reservoir and river system—as well as the effects of recreation-related dollars on our region's economy."

Interviews are being conducted on 13 TVA reservoirs and seven adjacent tailwaters (the sections of river immediately



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ROS Update:
A Look Ahead

The scoping report for the Reservoir Operations Study (ROS) will be available soon on TVA's Web site at www.tva.com.

The report outlines the issues and alternatives the study will address. It is based on extensive public input, including comments provided to TVA at 21 community workshops held across the region and by mail, e-mail, fax, and telephone. An interagency team and a public review group established by TVA also provided input.

A summary of the report is being mailed to participants in the community workshops and others who asked for information about the study. Copies also are available by writing to David Nye, ROS Project Manager, Tennessee Valley Authority, WT11A, 400 West Summit Hill Drive, Knoxville, TN 37902.

In the months ahead, TVA staff will analyze the potential environmental impacts of alternative reservoir operating policies and the trade-offs they represent. The results of this analysis will be documented in a draft Environmental Impact Statement (EIS), which will be distributed for public review and comment. The draft EIS also will identify TVA's preferred alternative. The TVA Board is expected to decide on the study's recommendations by late fall of next year.

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below the dams). Some reservoirs are on the main Tennessee River, others are on tributary rivers; some receive lots of recreational use, others don't.

Humphrey explains how the data collection process will work: "Each reservoir or tailwater will be sampled on the same 15 days during the five-month sampling period, which concludes in mid-October. Data will be collected at different times of the day, on different days of the week, and on weekends and holidays. Each location will have a number of sampling sites, with teams of two individuals assigned to each place (typically, a boat ramp, day use area, or campground) for a certain number of hours. During that time period, they will record the number of recreational users and vehicles and the types of activity

observed at that location. Individuals preparing to leave the site will be asked to spend about 10 minutes answering a series of questions about their recreation patterns and preferences."

Similar information will be obtained by mailing a response form to shoreline property owners, randomly selected from a list of applicants for boat dock permits, and by polling commercial operators (marinas, campgrounds, commercial outfitters, etc.).

Humphrey says he hopes people will consider the weight their opinions will have when they're deciding whether to participate in the data-gathering process. "I really hope the people who are approached at a public use area or receive a form in the mail will take a few minutes to let us know what they think. We need



everyone's input to accurately evaluate the potential impact of reservoir operating alternatives."

After all the sampling is completed this fall, the data will be analyzed by private consultants and documented in the Environmental Impact Statement, which is being prepared as part of the ROS.

According to Humphrey, the information obtained in the field will be used to verify data obtained from other sources—for example, studies on fishing use conducted by the Tennessee Wildlife Resources Agency and recreation-spending profiles developed by the U.S. Army Corps of Engineers for reservoirs that border the Tennessee Valley. "All this layering of information will help us reach more valid conclusions," says Humphrey. "We want our results to be absolutely solid—in order to provide a sound basis for decision-making."

The study, which got underway just before Memorial Day, is nearing the halfway point. So, what's been the reaction thus far? Are folks pretty agreeable to the idea of taking a few minutes to provide the necessary information? "I'm happy to report that we've had a very low refusal rate," says Humphrey. "Most people are more than willing to express their satisfaction or concerns with regard to recreational use of TVA reservoirs. There is truly no shortage of opinions on this subject!"



Americans Rate Hydropower #1

Hydroelectric power scored above wind, solar, natural gas, oil, nuclear energy, and coal as a preferred way of meeting future energy needs in a nationwide survey of registered voters.

The poll, commissioned by the National Hydropower Association (NHA) and conducted by Bisconti Research Inc. in January 2002, also showed that people view hydropower as good for the environment, clean, natural, renewable, and cost-efficient.

A summary analysis of the poll results, prepared by Bisconti Research Inc., can be downloaded from the NHA Web site at www.hydro.org.

In fiscal year 2001, despite very low rainfall across the Tennessee Valley, TVA's 29 hydro plants and one pumped-storage plant generated over 9.5 million megawatt-hours of electricity—enough to power 675,000 homes for a year.



Good News, Bad News

For the first time since 1998, all tributary reservoirs were at or above their targeted summer pool levels on June 1—thanks to near normal rainfall through mid-May.

However, late May and early June were unusually dry and hot, causing levels to drop on several tributary reservoirs as TVA released water to maintain downstream aquatic habitat and generate hydropower.

“The area above Chattanooga is still experiencing the effects of the drought that began in July 1998,” explains TVA’s Randy Kerr. “Even just a couple of weeks of dry weather have an almost immediate effect on streamflows. Much of the rain is absorbed into the ground or used up by growing plants before it ever reaches the reservoir system.”

For the first three weeks in June, the weekly streamflow average above Chattanooga—a good indicator of water availability across the Tennessee Valley—was less than 10,000 cubic feet per second. “That’s a near-record low for that time period,” says Kerr. “Out of the past 100 years, only 1988 had a lower weekly streamflow average.”

For more information concerning dry conditions, visit the NOAA Drought Information Center’s Web site at www.drought.noaa.gov.



TVA Reservoir Levels¹

	Observed July 1 Levels		January 1 Flood Guide Levels	
	feet	meters	feet	meters
Tributary Reservoirs				
Blue Ridge	1686.9	514.2	1668	508.4
Boone	1381.5	412.1	1357	413.6
Chatuge	1925.1	586.8	1912	582.8
Cherokee	1063.0	324.0	1030	313.9
Douglas	992.3	302.4	940	286.5
Fontana	1700.3	518.3	1644	501.1
Hiwassee	1516.9	462.4	1465	446.5
Normandy	874.4	266.5	864	263.4
Norris	1015.9	309.6	985	300.2
Nottely	1773.3	540.5	1745	531.9
South Holston	1723.0	525.2	1702	518.8
Tims Ford	888.0	270.7	873	266.1
Watauga	1951.3	594.7	1940	591.3
Main-River Reservoirs				
Chickamauga	681.5	207.7	677	206.4
Fort Loudoun/Tellico	812.4	247.6	809	246.6
Guntersville	595.1	181.4	593	180.7
Kentucky	359.1	109.4	354	107.9
Nickajack	633.9	193.2	633	192.9
Pickwick	414.1	126.2	410	125.0
Watts Bar	740.3	225.7	737	224.6
Wheeler	555.5	169.3	552	168.3
Wilson	507.0	154.5	506.2	154.3

¹ Elevations above mean sea level.

For the latest information on reservoir levels and releases, visit TVA’s Web site at <http://lakeinfo.tva.gov>, or call our toll-free information line: 632-2264 in Knoxville, 751-2264 in Chattanooga, 386-2264 in Muscle Shoals, or 800-238-2264 for all other locations. If you are hearing-impaired, call 800-438-2264.

Reservoir Operations Update

Whitewater Recreation Releases— Releases for whitewater recreation will continue on specified dates through November below Ocoee No. 2 and No. 3 Dams. Releases will continue through Labor Day below Apalachia, Wilbur, and Tims Ford Dams and on the Bear Creek Floatway.

Mosquito Fluctuations—Fluctuations in water levels to control mosquitoes in reservoir areas will continue through August 16 on Wheeler Reservoir and through September 20 on Guntersville Reservoir. Fluctuations for mosquito control on Chickamauga and Pickwick ended on July 26. These fluctuations, which reduce the need for chemical control, are designed to strand mosquito eggs and larvae on the shore where they dry out and die before the water rises again.

Fort Patrick Henry Drawdown—Starting November 4, TVA will begin a drawdown on Fort Patrick Henry Reservoir until the water level reaches elevation 1226 (about 35 feet below normal) on December 9. This is necessary for repairs to the spillway gates. During this time, TVA will also modify the dam so that a steel barrier, called a bulkhead, can be installed to keep water off the spillway gates so they can be tested without releasing water or requiring a drawdown. This should reduce the need for future drawdowns below normal operating levels. The work is scheduled for completion by late January—in time for the reservoir to fill to normal levels by February 2003.

Fontana Emergency Spillway Project—TVA plans to take the emergency spillway at Fontana Dam out of service due to damage from concrete growth. The emergency spillway has never been used and is not needed for the safe, continued operation of Fontana Dam and power plant. The work is scheduled for completion during the upcoming winter drawdown. The campground below the spillway, which was closed this summer because of the condition of the spillway dam, will reopen in August after reservoir levels are drawn down enough to reduce the water pressure on the structure.

Tennessee Growth Readiness Planning for Water Quality Protection

When it comes to sustainable economic development, water quality matters.

That's the message of a new program called "Tennessee Growth Readiness." The idea is to provide community planners and engineers with tools to help government officials, business leaders, and the public understand how land use impacts water quality and how they can comply with regulatory requirements and make informed decisions about managing growth.

The cities of Alcoa and Maryville, as well as Blount and Knox counties, are currently participating in a pilot of the program, which will roll out across the state in the spring of 2003.

"When we talked to the public about what issues were most important to them in terms of community growth, water quality was clearly a priority issue," says John Lamb, Blount County Director of Planning. "The people here realize what a valuable resource we have and they want to protect it as we grow."

Lamb and other planning/public works officials from the pilot cities and counties participated in the development of the program, which is co-sponsored by TVA, the Tennessee Department of Agriculture Nonpoint Source Program, the U.S. Environmental Protection Agency, and UT's Water Resource Research Center.

The focus is on nonpoint-source pollution, the contaminants washed off pastures, parking lots, housetops, lawns, and driveways by rain and carried into streams and reservoirs, says Lamb. "This program helps us show people in a clear, concise way that whatever happens in the entire watershed—and that includes their own driveway and lawn—is going to affect water quality for everybody."

Lamb has delivered a Tennessee Growth Readiness presentation to citizens at 22 meetings throughout Blount County, as well as to groups of local officials. The presentation is only about 20 minutes long, he says, but it's packed with factual information that's easy to understand. "It includes a description of impaired local streams and current land use patterns and trends, which helps to bring water quality issues close to home." Color-coded maps showing the percent of impervious surfaces—paved roads, parking lots, rooftops, and other surfaces that keep water from percolating into the ground—are used to emphasize the problem.

"The response so far has been excellent," says Lamb. "I've had people come up to me and say that this was the first time this subject has been clearly explained to them." At each meeting, residents are encouraged to make comments, offer suggestions, and get involved in the planning process.

Lamb feels Blount County's involvement in the Tennessee Growth Readiness pilot program will have a significant impact in the long term. "It's helping build a community-wide commitment to promoting and protecting water quality. Now, when a new subdivision, golf course, or gas station is proposed in the county, the consequences with regard to water quality will be a prime consideration for everyone."



Now Available:

2002 Black Bass Survey Results

The results of TVA's 2002 black bass population survey are in, and the overall picture is very favorable, according to Fisheries Biologist Donny Lowery. "We found an abundance of young-of-year bass, indicating a successful spawn and survival in 2001. The catch rate—an average of 45 bass per hour—was similar to last year."

The annual survey provides data on the number, age, and health of black bass in reservoirs throughout the Tennessee Valley. By comparing the results to previous years, fisheries biologists are able to identify population trends over time.

The sampling process is straightforward, says Lowery. "Volunteers fish for one hour at selected locations. Then TVA biologists use electrofishing equipment to collect fish at that same location. The fish are counted, weighed, measured, and released unharmed."

For a complete report, including survey results for individual reservoirs, visit TVA's Web site at www.tva.com/environment/water/.



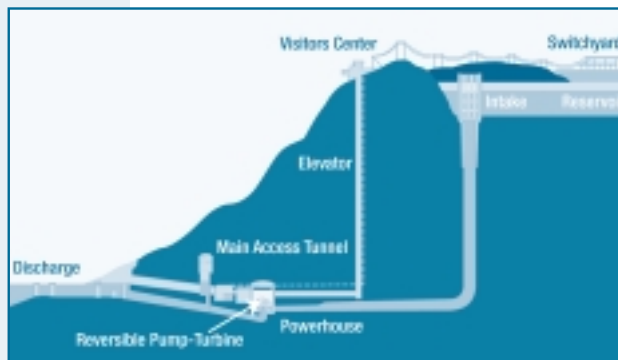
For more information on the Tennessee Growth Readiness program, contact the Tennessee Department of Agriculture Nonpoint Source Program at 615-857-5495, or send an e-mail to non.point@state.tn.us.

Getting More From the Mountain

At the ripe old age of 23, TVA's Raccoon Mountain Pumped Storage Plant is being modernized. All four turbines are being upgraded with the goal of increasing the plant's generating capacity, reliability, and efficiency.

Manager of Operations Gary Mauldin is proud of the progress to date. "Plant workers rebuilt the first turbine in record time. It was back up and running in 120 days, compared to an industry standard of 150 days. Then, after several lessons-learned sessions, the project team decided they could do even better, and they delivered. The second turbine was back online in just 83 days—five days ahead of schedule."

When the modernization of all four turbines is completed, Raccoon Mountain's total generating capacity is expected to increase by more than 15 percent.



During times of high demand for electricity, water is released from the Raccoon Mountain reservoir to generate power. When demand is low, the generating turbines are reversed to pump water back to the top of the mountain.

The Mountaintop Marvel

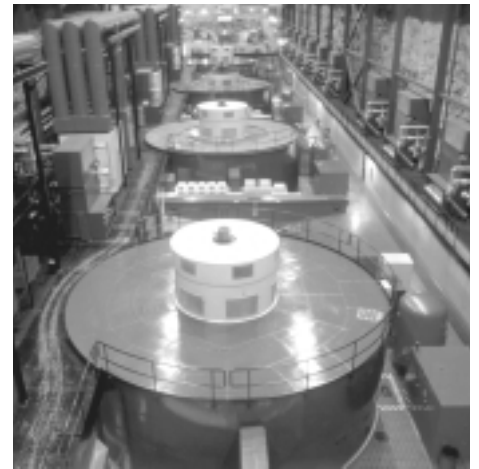
Raccoon Mountain, located just a few miles west of Chattanooga, still looks much the same as it did when Cherokee hunters stalked bear and wildcat there in the 1800s. It's still home to whitetail deer, woodchucks, gray foxes, a large wintering population of bald eagles and, of course, raccoons. But look closer . . .

Today, an artificial reservoir holding over 12 billion gallons of water sits on the mountaintop. And deep below—hundreds of feet down in the heart of the mountain—are elevators, lighted tunnels, and huge pieces of heavy machinery.

It's not a Hollywood set for a new James Bond movie. It's TVA's Raccoon Mountain Pumped Storage Plant—now recognized as one of America's most outstanding engineering projects.

Scorned at the outset as a scheme worthy of Rube Goldberg, pumped-storage systems have since proven their value. Designed to work like giant storage batteries, pumped-storage facilities require two water reservoirs, one located at a much higher level than the other. Energy is stored in the upper reservoir in the form of water. When this water is released to fall to the lower reservoir, the energy of motion is transferred to turbines attached to electric generators.

After careful study of the geology of Raccoon Mountain, TVA engineers con-



Together, Raccoon Mountain's four reversible-pump turbines produce over 1,500 megawatts of electricity—14 times more power than nearby Chickamauga Dam.

cluded that a pumped-storage facility could be built at the site. Construction began in 1970. More than 1,000 workers labored at Raccoon Mountain during the next several years, excavating 10 million cubic yards of earth to build the upper reservoir and sealing it with a huge 8,500-foot-long dam—the largest rock-fill dam ever built by TVA. The project also involved digging 12,000 feet of subterranean tunnels, carving a space the size of a football field out of solid limestone, and installing four massive vertical-shaft reversible-pump turbines.

Originally scheduled for completion in 1973, the Raccoon Mountain plant wasn't finished until 1979. The cost was about \$300 million, but it has worked well beyond all expectations. Water stored in the upper reservoir can provide 20 hours of continuous power generation during peak-demand hours and then can be pumped back up to the mountaintop during low-demand hours. The plant is also able to change power output rapidly, thus matching load and supply as well as providing a backup power source throughout the day.

It is this flexibility that makes Raccoon Mountain unique, according to Gary Mauldin,

Manager of Operations at TVA. “It’s designed for quick start-up. When extreme weather strikes or another plant shuts down, Raccoon Mountain is ready. In just a few minutes, it can start producing electricity—and lots of it. Raccoon Mountain is a major factor in

the efficient, reliable operation of the entire TVA power system.”

The Raccoon Mountain Visitor Center is open daily year-round, 9 a.m. to 5 p.m. EDT. Call 423-825-3100 for information.



In Answer to Your Question...

I'd like to see speed limits and noise level restrictions for boats on my lake. Can TVA help?

With more and bigger boats on Valley waters each year, speeding and engine noise can become problems. To find out what concerned citizens can do, we turned to TVA Police Lieutenant Chris Selmer.

States are responsible for establishing regulations regarding speed limits and engine noise.

At present, there are no speed restrictions on Tennessee Valley waterways; boats may travel as fast as they are able. However, all Valley states have regulations prohibiting “negligent operations,” or operations that endanger persons or property, including excessive speeding in congested areas. Excessive speed is subjectively determined by the marine patrol officer on the scene. In addition, all Valley states have regulations against operating at a speed that creates a wake in a “no wake” zone.

Only two Valley States have noise level restrictions. Tennessee and Alabama prohibit operation of a vessel that exceeds 86 decibels at 50 feet. Tennessee also has a muffler regulation designed to control exhaust noise and prevent muffler tampering. Most noise complaints result from violations of these muffler regulations.

Enforcement of these and other boating regulations—including regulations governing boat registration, life jackets, fire extinguishers, and sewage disposal—also is primarily the responsibility of state fish and wildlife agencies. However, enforcement authority is shared with TVA through its federal commissioning and through agreements with the U.S. Coast Guard and state agencies.

To learn more about boating regulations affecting your reservoir, check your state's Web site. To lodge a complaint, call your state fish and wildlife agency or the TVA Police.



Lake Watch: Keeping Your Reservoir Safe

TVA Police are working with interested citizens on reservoirs across the Valley to start Lake Watch programs.

Similar to “Neighborhood Watch,” the concept is to reduce crime and accidents on public property—TVA campgrounds, recreation areas, and waterways—by training local volunteers in how to recognize and report suspicious or unsafe activities. Lake Watch volunteers also receive information about boating safety regulations and clean boating practices.

Lake Watch coalitions already are in place on Fort Patrick Henry and Guntersville Reservoirs and in the Muscle Shoals area, covering parts of Wheeler, Wilson, and Pickwick Reservoirs.

If you are interested in forming a Lake Watch coalition on your reservoir, please contact TVA Police Captain Nancy Martin at 865-632-4029.



For TVA Police Assistance

If you wish to report a boating safety violation, request emergency assistance, or are a victim of or witness to a crime on TVA property, please call one of the numbers listed below.

Central District

(Chattanooga, South Central Tennessee, Georgia, North Carolina)
1-800-548-4005
423-751-3783
423-751-2605 (TDD)

Eastern District

(Knoxville, East-Northeast Tennessee, Virginia)
1-800-824-3861
865-632-3631
865-632-4318 (TDD)

Northern District

(Kentucky, Nashville, Northwest Tennessee)
1-800-839-0028
731-644-9911
731-641-4026 (TDD)

Western District

(Muscle Shoals, North Alabama, Mississippi, Southwest Tennessee)
1-800-839-0003
256-386-2444
256-386-2225 (TDD)

TVA Watershed Teams

Boone, Bristol Projects, Fort
Patrick Henry, South Holston,
Watauga, Wilbur:
423-239-2000

Cherokee, Douglas, Nolichucky:
865-632-3791

Norris:
865-632-1539

Melton Hill, Watts Bar,
Great Falls:
865-988-2440

Fontana, Fort Loudoun, Tellico:
865-988-2420

Apalachia, Blue Ridge, Chatuge,
Hiwassee, Nottely, Ocoee 1, 2, 3:
828-837-7395

Chickamauga, Nickajack:
423-697-6006

Guntersville:
256-571-4280

Wheeler:
256-386-2560

Pickwick, Wilson, Bear Creek
Projects:
256-386-2228

Kentucky, Beech River Project:
731-641-2000

Tims Ford, Normandy:
256-386-3442



GOOD IDEAS FROM RESERVOIRS ACROSS THE VALLEY

Go Native!

Blooming meadows bring more than just beauty to reservoir shorelines

They may look like backdrops for a watercolor painting, but the wildflower meadows and native grass prairies planted along TVA reservoir shorelines are serving a very utilitarian purpose. They're helping to hold eroding soils in place, providing habitat for butterflies and birds, and preventing polluted runoff from reaching the water.

While an expanse of purple cone-flower, butterflyweed, dense blazingstar, smooth aster, and little bluestem is a sight to behold, its real value is much more than aesthetic—a fact appreciated by TVA Wildlife Biologist Wes James. He and other TVA Watershed Team mem-

bers have been a part of efforts to initiate native planting projects at Fort Loudoun, Melton Hill, Norris, Watts Bar, Muscle Shoals, and other TVA public lands.

The key to the effectiveness of native plantings lies underground, James explains: “The roots of native grasses can reach down eight to 10 feet, holding soils in place and preventing erosion. Typical non-native turf grasses, on the other hand, have roots of only six inches or so; these ‘lawn’ grasses can do little to prevent shoreline loss.”

James and other TVA Watershed Team members are helping homeowners at Tanasi Lagoon in Tellico Village create a demonstration meadow to promote the use of native plants along the reservoir. TVA is also providing packets of native warm season grass and black-eyed Susan seeds to shoreline and streambank property owners in some parts of the Valley.

“Folks are somewhat apprehensive about these meadows at first because they look so different from the neatly trimmed lawns they are used to,” says James. “So a major component of our efforts is to educate property owners about the benefits of planting even a narrow strip of native grasses and wildflowers.”

According to James, it's a proven fact: native plants can be a great alternative to turf grass lawns. The very best approach is to preserve all native vegetation (trees, shrubs, etc.) to act as a “buffer” along the reservoir shoreline. But for locations that have traditionally been mowed right to the water's edge, native grasses and wildflower meadows are much preferred for their ability to create wildlife habitat and improve water quality. And, because most native flowers and grasses are fairly low-growing, they can provide views of the water with very little maintenance required.

Since it takes roughly three years for a meadow to become fully established, patience is required from those making the switch from lawn or barren soil to wildflowers and native grasses. But as anyone who looks out over a meadow filled with blooming wildflowers will attest, the wait is well worth it.

To learn more about the benefits of meadows and grass prairies, or to get started on a native planting along your reservoir property, call your local TVA Watershed Team.



TVA Watershed Team members worked with Native Gardens Nursery and the Bobwhite Chapter of Quail Unlimited to sow a native grass and wildflower plot on a portion of Fort Loudoun Dam Reservation. Native Gardens owner Meredith Clebsch is shown here checking the first year's growth.

Thermal Stratification 101:

A quick guide to summer beneath the surface

Jump off a boat or dock into a reservoir any hot summer day, and you'll get a pretty good idea of how the natural process of thermal stratification works. Your initial plunge brings you down into deeper, cooler water; then you pop back up to the warmer surface water that's been heated by the sun's rays.

During cooler weather, water temperatures in TVA reservoirs are pretty uniform from the surface to the bottom. However, as the days get longer and hotter throughout the summer, the temperature of the surface water rises. Since warm water is less dense than cold water, it literally floats on top of the cooler water. This density difference inhibits mixing, resulting in thermal stratification—the separation of water into horizontal layers due to temperature differences.

Less oxygen for bottom life

So what's the problem? If the layers don't mix, the bottom water becomes trapped. The deeper water is not replenished with oxygen from the air or from contact with the oxygen-rich surface water. This results in low dissolved oxygen (DO) levels in the lower layers of the water column, which adversely impacts aquatic life and water quality.

"When thermal stratification occurs, several scenarios are set in motion," says TVA scientist Tyler Baker. "Over time, as organic material sinks to the bottom and decays, DO is depleted. This can affect fish preferring the colder water in the lower layers of the water column and bottom-dwelling organisms such as mussels and insect larvae. At extremely low oxygen levels, undesirable levels of iron, manganese, and sulfide can be released from the sediment. This can cause taste and odor problems in drinking water and increase water treatment costs."

The amount of nitrogen, phosphorus, and other nutrients entering the water through soil erosion, sewage treatment plant discharges, polluted runoff, and other sources affects this process. The more

nutrients, the more algal growth; the more algal growth, the more decaying organic matter and the higher the oxygen demand near the bottom.

The arrival of fall, with shorter days and cooler air temperatures, cools the surface water, gradually allowing it to blend with more and more of the water column. By late October or November, the reservoir has "turned over"—meaning temperatures and DO levels are equalized from surface to bottom.

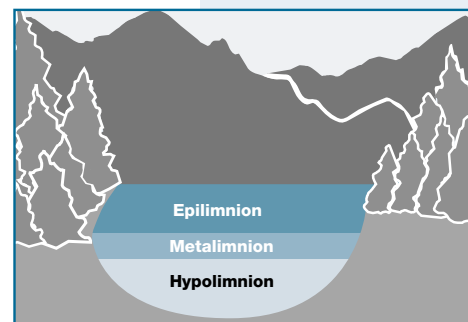
Dealing with downstream impacts

Hydroturbine intakes typically draw water from the lower part of the upstream reservoir, which can create low-oxygen conditions immediately downstream of dams, especially during late summer and early fall. To address this problem, TVA has installed special aeration equipment at many of its dams to add oxygen to the water. "We keep a close watch on oxygen levels and other water quality conditions throughout the summer," says Baker. "That way, we can minimize any problems that may develop by adjusting flows or stepping up the use of aeration equipment. That's an enormous benefit to aquatic life, as well as to municipal and industrial water users who depend on the river's assimilative capacity—especially during hot, dry summers such as those we've experienced recently."

For more information on how TVA protects water quality below its hydropower dams, including a description of the methods TVA uses to boost oxygen levels, visit www.tva.com/environment/water/.

For the Latest Information On Reservoir Health...

Visit TVA's Web site at www.tva.com/water. You'll find detailed information on conditions in individual reservoirs, including the amount of dissolved oxygen in the water; the amount of chlorophyll (a measure of the amount of algae); the number and variety of healthy fish; the number and variety of animals living on the reservoir bottom; and the amount of PCBs, pesticides, and metals in the bottom sediment. Information on state-issued advisories on swimming and fish consumption also is available.



Thermally stratified lakes exhibit three distinct zones: a warm, oxygen-rich top layer, called the epilimnion; a cold, oxygen-poor bottom layer, called the hypolimnion; and a middle zone, called the metalimnion, which is characterized by a rapid change in temperature and oxygen with increasing depth.

Navigation Aids— Who To Call

To report missing or damaged buoys, information boards, or other navigation aids on recreational channels on the Tennessee River and its tributaries, call TVA at 865-632-4678.

To report missing or damaged navigation aids marking the commercial navigation river channel, call the U.S. Coast Guard. From Paducah, Kentucky, to Paris Landing, Tennessee, call 901-642-4457. Above Paris Landing to Knoxville, call 423-622-2101.



Dam Safety Inspections Taking a Good Look, Above the Water and Below

What's it like to dangle from a rope hundreds of feet in the air with nothing but deep water far below? Exhilarating, according to members of TVA's Rope Access Team.

These are the engineers who regularly rappel down the face of dams—looking for anything that might interfere with the structural integrity of the water barrier. This particular method has been a part of TVA's dam safety inspection program for the past couple of years. And while it may look like a whole lot of fun—or a daredevil stunt, depending upon your point of view—there are compelling reasons for employing this innovative technique.

“We take our job very seriously,” states Vann Newell—and you believe him when he says it. Newell is the manager of TVA's Inspection and Instrumentation section. It falls to him and his colleagues to do whatever it takes to make sure that the physical structures (dams, power plants, levees, pumping stations, etc.) along the TVA

reservoir system are sound and that the equipment associated with their operation is working properly. “We are committed to finding even the slightest deficiency and getting it remedied right away, before it turns into a bigger problem. Rope access helps us on a couple of different levels: we get the best possible look at anything that might turn into a safety concern, and we avoid having to use other methods that are more costly and time-consuming.”

A good example is the recent inspection of the spillway tunnels at Fontana Dam. (The dam features a design unique in the TVA system. Water is released through spillway gates on the side of the dam and diverted into two 600-foot tunnels; this method routes the water farther down the river and then shoots it up into the air to dissipate energy and avoid eroding the channel.) Using rope access, crews were able to check both tunnels in a single day—thereby avoiding the need for constructing hundreds of feet of scaffolding.

There's an ongoing process of inspection and maintenance for all 91 structures (49 of which are dams) along the reservoir system. In keeping with guidelines established by the Federal Emergency Management Agency (FEMA), every dam is painstakingly evaluated in a formal inspection every five years—including the “up close” view afforded by rope access. In addition, teams of mechanical, civil, and electrical engineers go over each facility every two and a half years, and civil and instrumentation engineers perform an annual inspection on each dam in the TVA system. Not only that, but each facility also performs its own internal inspection each month. This “layered” approach to inspections helps ensure that every potential problem is spotted before it becomes a major concern—and that everybody's focused on



A special “moon suit” was used during the most recent inspection of the outlet tunnel near the bottom of Fontana Dam. The suit enables a diver to work for an extended period at a depth of 200 feet or more.



An engineer on TVA's Rope Access Team rappels down a spillway bay at Nickajack Dam in order to check the condition of the gate. Inspection crews operate in three-person teams, each member of which has completed a minimum of 40 hours of training and passed a test administered by outside instructors. Team members must undergo a two-day recertification process every year to keep their skills current.

safety as the number-one priority. "There's a prevailing attitude," explains Newell, "that whether you're the plant manager or the guy that mows the grass on the reservation, dam safety is part of your job."

The purposes for which inspections are conducted are many—and so are the number of things which must be carefully examined. There are the big things: seismic analyses (ensuring that TVA dams wouldn't fail in the event of all but the most catastrophic of earthquakes) and probable maximum flood modifications (providing additional spillway capacity or raising the dam to withstand a flood of even maximum proportions). There are the small things: routine gate problems, a cracked weld, a frozen roller, or a bad trunnion bearing. Some are relatively quick fixes while others turn into major projects. And not all the potential problems are above the waterline: many regularly scheduled inspections involve using divers or remotely operated vessels to inspect everything from spillway aprons to trash racks.

Although many TVA dams were built over a half-century ago, when technologies were much different than they are today, Newell says they are in remarkably good shape: "The fact that they did such a good job on the design of these dams and that they were so well built makes our job easier. For everything to have lasted the way it has really says something for the original design and construction."

Newell wants those who live along and use TVA reservoirs to know that there's a good reason for any temporary inconvenience they might experience when, say, water levels are drawn down below normal elevations to inspect or repair spillway gates. "We really try to minimize the impact to the public," he explains, "but the bottom line is safety. It's our responsibility as stewards of these facilities. We're doing everything we can to ensure that these dams will be around—and providing multiple benefits for the Tennessee Valley region—for many more years."

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TVA River Neighbors

Tennessee Valley Authority
Post Office Box 1589
Norris, Tennessee 37828

Phone: 865-632-1663
Fax: 865-632-1534
E-mail: riverneighbors@tva.com
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Recreation Facilities Get Facelift

“TVA is continually striving to improve the public’s recreational experience.” That’s according to Ralph Jordan, a TVA Recreation Specialist, and the facts tend to back him up. Many recreational facility improvements have been or will be completed on TVA public lands during 2002.

These include upgrades—new electric hookups at Cherokee, Douglas, and Watauga campgrounds and replacing old hookups at Mallard Creek—as well as additions: a new handicapped-accessible fishing pier below Melton Hill Dam; solar lighting at a parking area at Raccoon Mountain; a paved boat ramp access road at Dogwood Reservoir near Lexington, Tennessee; and a new fishing pier at Kentucky Dam’s Mouse Tail Landing.

New campsites were added at Melton Hill and several sites were redefined at Barton Springs Campground on Normandy.



A pedestrian bridge was replaced on the Muscle Shoals reservation, the Tims Ford tailwater parking lot was paved, and two floating piers at Nickajack were replaced by a single fixed pier.

Probably one of the most significant and visible improvements is the new day-use area at TVA’s Tellico Dam reservation. Amenities include a pavilion, a sand beach with a defined swimming area, restrooms, picnic sites, and a one-half-mile handicapped-accessible walking trail, which ties in to the top of Tellico Dam.