

Everyone needs to do  
what he or she can.

Remember that the current high quality of Melvern Lake has been possible because of the sound management practices already in place in the watershed. By maintaining and improving these, we can keep Melvern Lake clean for our children and grandchildren.



Melvern Lake

- Melvern Lake, Kansas (U.S. Army Corps of Engineers) Grasslands Management
  - Managing KS Grasslands for Water Quality (MF-2086) Cropland Management
  - Best Management Practices for Nitrogen (MF-2022), Phosphorus (MF-2321) and Atrazine (MF-2182).
  - Feedlot Management
  - Improving Animal Waste Management (EP-39).
- Or visit our web site at <http://www.oznet.ksu.edu>

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# Keeping Melvern Lake Clean



*Now and for  
the Future*

## Water quality is key for Melvern Lake.

Melvern Lake stands as one of the cleanest major reservoirs in Kansas. Even so, years of lake monitoring data indicate it is not without its problems.

**What is water quality?** There is no single standard for clean water. Water that is clean enough for crop irrigation is different from water that is clean enough for spawning fish or for people to drink. Because Melvern Lake water is treated and used for human drinking water, it must be managed to meet standards for this use.

**What affects lake water quality?** Reservoirs not only collect water but also everything that flows in with the water. Most of the water in streams feeding Melvern Lake comes from water that runs off land after rainstorms. After rain falls to the ground, it either soaks in or runs off. The runoff water carries soil and things that dissolve easily into water (like mineral salts, fertilizers, pesticides, and bacteria) along with it to the stream and ultimately to Melvern Lake itself.

Even the highest quality mountain lake water contains sediments, minerals, and even other natural and man-made chemicals. At low levels, these contaminants may not be a problem. However, as they accumulate, the lake reaches a level where it cannot support its intended uses. In other words, it becomes polluted. Poor quality water must be treated. This costs money. In many cases, it is easier to keep pollutants out of the lake to begin with. But this takes effort too.

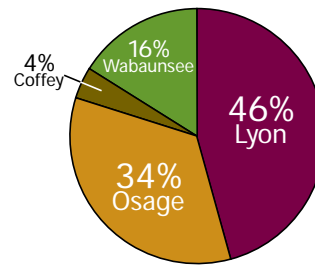
## Melvern Lake quality is linked to upstream lands.

To understand the sources of Melvern Lake's water and pollutants, we must understand how the land and its watershed is used.

Land from four counties drains into Melvern Lake. Livestock outnumber people by about 20 to 1, and a rural lifestyle is still enjoyed by the 1,500 people within Melvern Lake's watershed. Unlike other nearby areas, the watershed has not seen much development, even though the Kansas Turnpike makes it accessible for commuters from Topeka, Kansas City, and Wichita (each within a 90 minute drive).

The area remains largely grazing land because of shallow soils and moderately steep topography, particularly the northern portion of the watershed in the scenic and rolling Flint Hills. The flood plains closer to Melvern Lake and bottomlands throughout the basin support crop production.

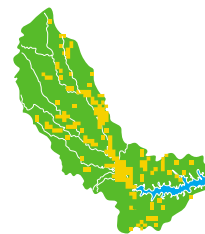
The watershed receives an average of 35 to 37 inches of rainfall per year. Of that rainfall, one-fifth runs off the land into streams on route to Melvern Lake. This runoff can carry pollutants. Half of this rainfall occurs from May to August, the summer crop growing season. However, it is during springtime thunderstorms, when



Watershed area by county.

crops aren't protecting the ground, that the pesticide atrazine and animal-borne fecal coliform bacteria have been found in Melvern Lake.

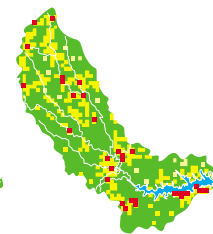
To help understand how changing land uses in the watershed would affect lake water quality, a computer model was developed at Kansas State University. With the help of local residents and state agencies



**Land Use**  
Crop (yellow) and  
Grassland (green)



**Animal  
Production**



**Erosion**  
Low (green),  
Medium (yellow)  
and High (red).

interested in the Melvern watershed, several possible scenarios for the future were tested. Though Melvern Lake can never be clear and blue, it can get better or worse depending on how the land above it is managed.

## Steps to keep Melvern Lake clean.

Melvorn Lake is reasonably clean now, -- who would want it any other way? But keeping water clean takes work. Here are a few things that we can do to keep Melvern Lake clean so that our children and grandchildren can enjoy it the same way we do today.

**Feedlots.** A common practice within the watershed is raising livestock. Any confined feeding area,



where there are enough animals to compact soil and prevent vegetation from growing or where concrete pads are used,

has a potential for high water runoff and high pollutant levels in that runoff. Steps must be taken to reduce both runoff and pollutants.

- Buffer strips of grass or trees between the lowest part of the feedlot (where water exits) and the nearest waterway help reduce the impact of feedlot runoff. Animal access to these strips must be minimized for the filters to work.
- Animals should not be able to walk or wade in water that flows off-site. Control their access to streams and waterways using fencing and automatic watering devices.

**Croplands.** One-fifth of the watershed area produces field crops, mainly wheat, corn, milo, and soybeans. Many farming practices that reduce



runoff and erosion help both crop production and water quality, and are already in place. These need to continue.

- Farming along

field contours and keeping terraces intact helps reduce runoff and erosion from crop fields.

Although some terraces are low and easy to cross with tillage, planting and harvesting equipment, routinely crossing terraces breaks it down,

shortens its life and maintenance interval, and increases pollutants leaving the field.

- Proper timing of fertilizer and pesticide applications is critical to keeping these products on the field where they can benefit the crop. More product kept on the field means less product in the water.
- Cropland filter strips can reduce nutrients and pesticides in runoff, and are available for cost-share.
- There are many best management practices that can be tailored to specific field conditions, crops, soils, and farming styles. Seek reliable information sources for help in picking the best ones for each field.

**Grasslands.** Eighty percent of the watershed area is used for grazing, hay, or native vegetation.

These lands are naturally low in runoff and erosion



when well maintained. However, because these soils are often relatively high in phosphorus, a nutrient that

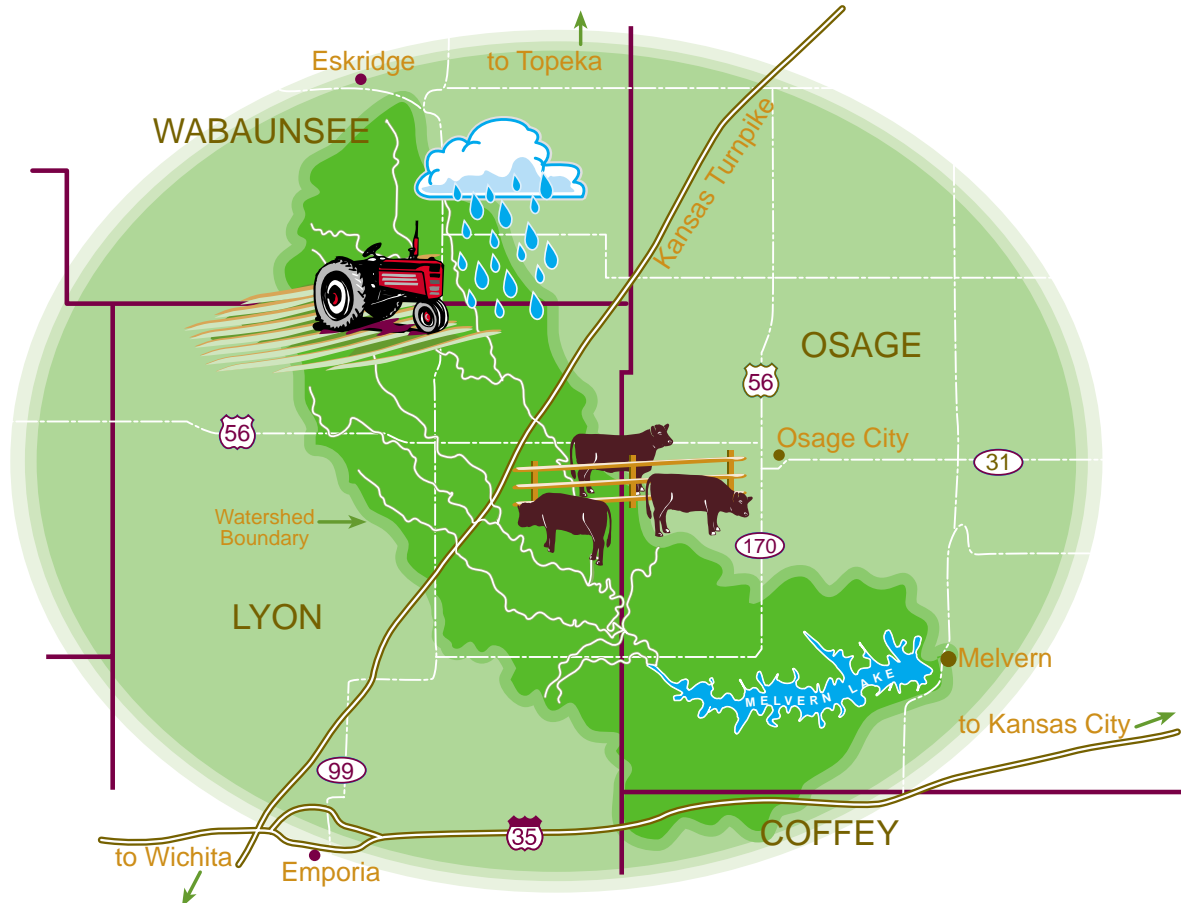
contributes to algae growth in Melvern Lake, even low levels of erosion from these lands can have a major impact.

- Maintain a good stand of grass by not overgrazing. A poor stand of grass exposes soil and allows it to erode more easily.
- Streams and waterways should be protected by restricting cattle access and locating feeding areas away from these areas. This keeps wastes out of the water flow and maintains the function of buffers around these areas.

# Welcome to Melvern Lake

One of 22 Kansas multi-purpose reservoirs, Melvern Lake has been in operation for more than a quarter century. Its depth averages 8 to 20 feet but reaches 60 feet near the dam. Melvern dam is located in Osage County along the upper Marais des Cygnes River.

Water from the 225,000-acre upstream watershed fills the Melvern Lake to an area of 6,930 acres. This water is a resource for local communities and the State of Kansas.



## Melvern Lake has many uses.

Melvern Lake is a multipurpose reservoir used for public water supply, recreation, and flood control.

**Water Supply.** One-third of the lake volume is allocated for public water supply. Today, Osage City (pop. 2,700) and Burlingame (pop. 1,000) purchase water from the lake along with Wholesale Water District #12 that serves a number of other towns, communities and rural water districts. Even with all these users, only about 5% of the water available for public use is being tapped.

**Recreation.** Thousands of people each year enjoy boating, swimming, water skiing, and camping in and around Melvern Lake. The Lake's high quality fishing is renown. These activities draw visitors and improve the area's economy, especially during the summer months.

**Flood Control.** One of the most important functions of Melvern Lake is flood control. Outflow from the reservoir is managed by the Army Corps of Engineers to decrease the chance of flood damage downstream.