



## **State of the Environment in Jefferson County**

**27 April 2010**

**A Report from the Environment Foundation Team**

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## Jefferson County's Air Quality

### Air Quality Index (AQI) Report for Jefferson County

|   |     |
|---|-----|
| Number of days with AQI data                          | 245 |
| Number of days AQI was Good                           | 181 |
| Number of days AQI was Moderate                       | 61  |
| Number of days AQI was Unhealthy for Sensitive Groups | 3   |
| Number of days AQI was Unhealthy                      | 0   |
| Maximum AQI value                                     | 140 |
| 90th percentile AQI value                             | 77  |
| Median AQI value                                      | 44  |
| Number of days main AQI pollutant was ozone           | 245 |

Since the end of 2004, Jefferson County has been designated with "nonattainment" status for EPA's health-based standards for 8-hour ozone pollution.

*U.S. EPA 2008 "AirData" Air Quality Index Report*

### High ozone days / 2005-2007

|                    |      |
|--------------------|------|
| Ozone Grade:       | F    |
| Weighted Average:  | 15.0 |
| Orange Ozone Days: | 42   |
| Red Ozone Days:    | 2    |
| Purple Ozone Days: | 0    |

Note: The ozone grade is based on a weighted average calculated using the Air Quality Index. The number of unhealthful days experienced by the county was assigned a factor for weighting purposes: each orange day, a factor of 1; each red day, 1.5; each purple day, 2. By multiplying the total number of days within each category by its assigned factor, a total was determined. The grade was determined using the weighted average. Grade is assigned by weighted average as follows: A=0.0; B=0.3-0.9; C=1.0-2.0; D=2.1-3.2; F=3.3+

*American Lung Association, "State of the Air 2009"*

### Jefferson County Exposure to Criteria Air Pollutants

| Summary of Pollutant Concentrations for Jefferson County |                |                                      |            |                             |                               |
|--|----------------|--------------------------------------|------------|-----------------------------|-------------------------------|
| Pollutant  | NAAQS Standard | Highest Recorded Concentration (HRC) | Second HRC | Number of NAAQS Exceedances | Stations Monitoring Pollutant |
| Ozone (1-hour average)                                   | 0.12 ppm       | .13 ppm                              | .1 ppm     | 1                           | 1                             |
| Ozone (8-hour average)                                   | 0.08 ppm       | .1 ppm                               | .09 ppm    | 4                           | 1                             |

*U.S. EPA Air Quality System and National Emissions Trend database, 2003*

### Jefferson County Diesel Emissions (2005)

Jefferson County ranks #31 out of 95 counties in the state for health risk from diesel soot.

| Pollutant                        | Tons per Yr | Highway (on road) | Heavy Equipment (non road) |
|----------------------------------|-------------|-------------------|----------------------------|
| NOx (Nitrogen Oxide)             | 2,270       | 2,047             | 223                        |
| PM 2.5 (Particulate Matter)      | 76          | 58                | 19                         |
| PM 10 (Particulate Matter)       | 87          | 67                | 19                         |
| CO (Carbon Monoxide)             | 541         | 440               | 102                        |
| VOC (Volatile Organic Compounds) | 106         | 85                | 22                         |
| SO2 (Sulfur Dioxide)             | 87          | 57                | 30                         |

NOTE: The smaller the size of the particulates, the more dangerous—from a human health perspective. Smaller particles (PM 2.5) penetrate deeper into the respiratory system, causing more damage.

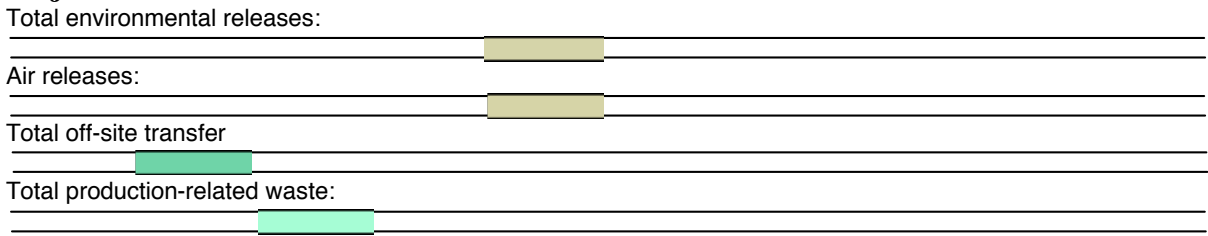
*Clean Air Task Force, 2010*

## Jefferson County's 2002 National Rankings: Major Chemical Releases / Waste Generation

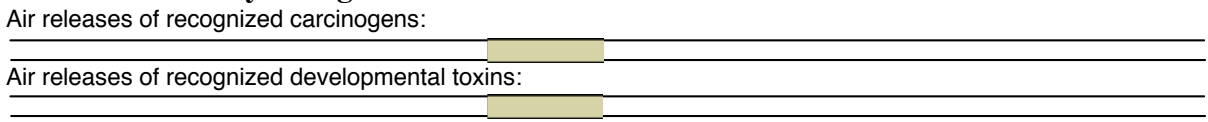
WITHIN Tennessee, Jefferson County ranks # 43 out of 80 counties with major chemical releases or waste generation. For a national comparison, see below.

**Cleanest/Best Counties in US**      Percentile      **Dirtiest/Worst Counties in US**  
 0%    10%    20%    30%    40%    50%    60%    70%    80%    90%    100%

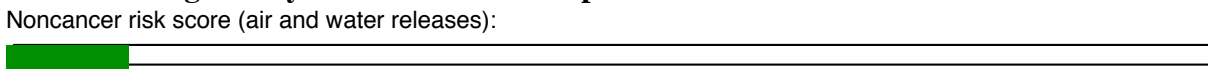
### Major Chemical Releases / Waste Generation



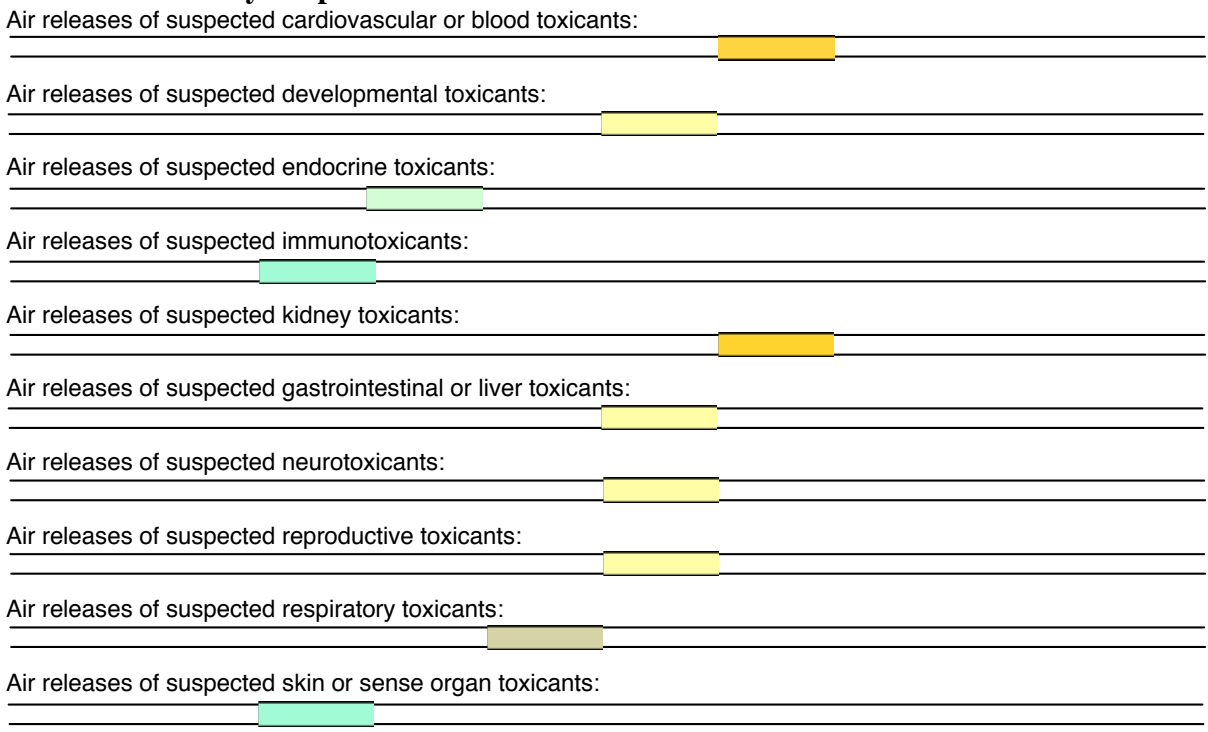
### Releases Sorted by Recognized Health Effects



### Releases Weighted by Potential Health Impacts



### Releases Sorted by Suspected Health Effects



0%    10%    20%    30%    40%    50%    60%    70%    80%    90%    100%  
**Cleanest/Best Counties in US**      Percentile      **Dirtiest/Worst Counties in US**

Data for above four charts derived from Toxics Release Inventory, U.S. Environmental Protection Agency, 2002.

## TRI Data Summary of Environmental Releases, Transfers, and Production-Related Waste in Jefferson County (*Pounds from TRI sources*)

| Year | Air Releases | Water Releases | Land Releases | Under-ground Injection | Total Env'l Releases | Total OffSite Transfers | Total Production-Related Waste |
|------|--------------|----------------|---------------|------------------------|----------------------|-------------------------|--------------------------------|
| 1990 | 350,848      | 0              | 0             | 0                      | 350,848              | 5,591                   | NA                             |
| 1991 | 429,039      | 0              | 0             | 0                      | 429,039              | 4,162                   | 477,345                        |
| 1992 | 310,931      | 0              | 0             | 0                      | 310,931              | 1,400                   | 328,173                        |
| 1993 | 314,226      | 0              | 0             | 0                      | 314,226              | 0                       | 341,728                        |
| 1994 | 252,954      | 0              | 0             | 0                      | 252,954              | 16,013                  | 266,445                        |
| 1995 | 227,692      | 0              | 0             | 0                      | 227,692              | 9,103                   | 225,817                        |
| 1996 | 231,796      | 0              | 0             | 0                      | 231,796              | 3,743                   | 233,482                        |
| 1997 | 225,682      | 0              | 0             | 0                      | 225,682              | 9,584                   | 227,928                        |
| 1998 | 127,125      | 1,530          | 2,000,052     | 0                      | 2,128,707            | 839                     | 2,127,739                      |
| 1999 | 85,876       | 500            | 1,672,904     | 0                      | 1,759,280            | 2,150                   | 1,758,450                      |
| 2000 | 94,995       | 2,191          | 1,073,540     | 0                      | 1,170,726            | 3,160                   | 1,175,402                      |
| 2001 | 114,405      | 1,639          | 585,054       | 0                      | 701,098              | 9,900                   | 714,845                        |
| 2002 | 117,116      | 0              | 0             | 0                      | 117,116              | 7,800                   | 131,340                        |

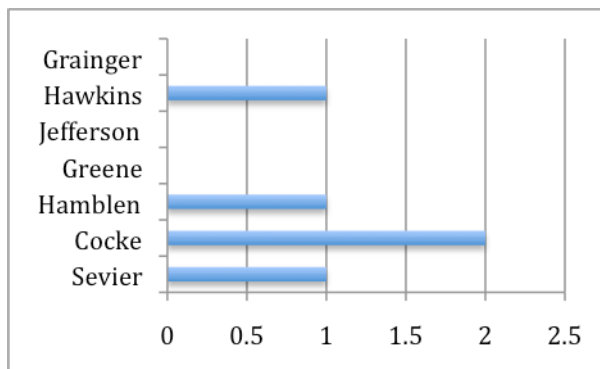
*US EPA Toxic Releases Inventory, 2002*

### Toxic Releases: 2008 Chemical Report, Jefferson County

The chart shows substances reported disposed of, or otherwise released (in pounds), for facilities in all industries, for all chemicals, Jefferson County, Tennessee, 2008.

| Chemical (amounts given in pounds) | Total On-site Disposal or Other Releases |
|------------------------------------|--|
| COPPER COMPOUNDS                   | 85,640                                   |
| DIISOCYANATES                      | .  |
| LEAD COMPOUNDS                     | 52,870                                   |
| MERCURY COMPOUNDS                  | 68                                       |
| XYLENE (MIXED ISOMERS)             | 11,718                                   |
| ZINC COMPOUNDS                     | 2,225,487                                |
| <b>Total</b>                       | <b>2,375,783</b>                         |

*US EPA Toxic Releases Inventory, 2010*



### Air Pollution Control Permit Violations

In 2009, the Tennessee Department of Environment and Conservation recorded Jefferson County as having **zero** Air Pollution Control Permit Violations. For a comparison with neighboring counties, see chart at left.

*TDEC Enforcement Database, 2009*

## Vehicle Emissions in Relation to Health Issues

Vehicles emit many pollutants into the air, including carbon monoxide, carbon dioxide, hydrocarbons, nitrogen oxides, sulfur oxides, and volatile organic compounds. These pollutants then also combine to form secondary pollutants such as fine particulate matter and ozone. The resulting air quality is harmful to all who breathe it, although some groups are more at risk than others.

| Average Daily Traffic Volumes for Major Jefferson County Thoroughfares | 2006   | 2007   | 2008   |
|--|--------|--------|--------|
| I-40 (Sevier County to I-81)   | 57,971 | 60,477 | 57,435 |
| I-40 (I-81 to Cocke County)  | 29,196 | 29,171 | 33,937 |
| HWY 11E (Jefferson City to Hamblen County)                             | 21,525 | 22,413 | 23,332 |
| HWY 11E (Jefferson City to Knox County)                                | 15,822 | 15,987 | 16,270 |
| HWY 25W/70   | 3,890  | 3,462  | 2,404  |
| HWY 92   | 14,115 | 14,207 | 14,429 |
| HWY 25E  | 11,045 | 11,432 | 10,753 |
| HWY 139  | 3,034  | 3,365  | 3,022  |
| HWY 66   | 4,102  | 4,023  | 5,156  |

*Tennessee Department of Transportation, 2010*

## Groups at Risk for Health Issues Related to Air Quality Problems

| County           | Total Pop    | Under 18     | 65 & Over   | Pediatric Asthma | Adult Asthma | Chronic Bronchitis | Emphysema  | Cardiovascular Disease | Diabetes    |
|------------------|--------------|--------------|-------------|------------------|--------------|--------------------|------------|------------------------|-------------|
| <b>JEFFERSON</b> | <b>50221</b> | <b>11123</b> | <b>7268</b> | <b>1011</b>      | <b>3373</b>  | <b>1344</b>        | <b>682</b> | <b>14441</b>           | <b>3117</b> |
| KNOX             | 423874       | 94055        | 53860       | 8551             | 28537        | 11248              | 5539       | 119130                 | 25590       |
| SEVIER           | 83527        | 18604        | 12193       | 1691             | 5633         | 2270               | 1175       | 24604                  | 5344        |

*American Lung Association, "State of the Air: 2009" report*

## Estimated Prevalence and Incidence of Lung Disease in 7 Tennessee Counties

| County           | Total Population | Pediatric Asthma | Adult Asthma | Chronic Bronchitis | Emphysema  | Lung Cancer |
|------------------|------------------|------------------|--------------|--------------------|------------|-------------|
| Cocke            | 35688            | 735              | 2491         | 1248               | 526        | 30          |
| Grainger         | 22708            | 473              | 1581         | 785                | 323        | 19          |
| Greene           | 66157            | 1323             | 4655         | 2333               | 1009       | 56          |
| Hamblen          | 62132            | 1366             | 4255         | 2108               | 881        | 53          |
| <b>Jefferson</b> | <b>51074</b>     | <b>1063</b>      | <b>3556</b>  | <b>1742</b>        | <b>707</b> | <b>44</b>   |
| Knox             | 430019           | 8992             | 29909        | 14613              | 5651       | 367         |
| Sevier           | 84835            | 1785             | 5887         | 2933               | 1219       | 72          |

*American Lung Association of Tennessee, 2010*

## Jefferson County's Energy Consumption

*Note: the following consumption of kilowatt hours (Kwh) occurred in a single month, March 2010. Energy use will always vary according to season, weather, etc.*

|                         | Number of Members | Kwh Usage  |
|-------------------------|-------------------|------------|
| <b>Residential</b>      | 19,820            | 39,851,624 |
| <b>Small Commercial</b> | 3,028             | 3,658,606  |
| <b>Large Commercial</b> | 229               | 8,083,513  |
| <b>Industrial</b>       | 7                 | 6,554,774  |

(In this latest report, the breakdown of electric classifications has been updated and expanded from the format used in 2009. The "residential" listing now truly reflects nothing but homes, while the commercial category has been divided into small and large businesses.)

*Appalachian Electric Cooperative, 2010*

### Green Power Switch Program (GPS)

TVA and Appalachian Electric Cooperative offer 150 Kwh blocks of green power to be associated with power produced from renewable forms of energy such as solar, wind and biomass. These blocks are available for purchase by the consumer at a cost of \$4.00 monthly. Currently, this program has 34 residential members in Jefferson County (as compared to 31 members in 2009). These consumers purchase 61 blocks of renewable power each month, which totals 9,150 Kwh. At this time, there is one commercial member active in the program. This consumer purchases five blocks of green power totaling 750 Kwh each month.

Residential members of the GPS program are found in the following areas:

Jefferson City Area: 17 members – purchasing 31 blocks

Dandridge Area: 10 members – purchasing 14 blocks

White Pine Area: 3 members – purchasing 5 blocks

Sandy Ridge Area: 1 member – purchasing 2 blocks

New Market Area: 3 members – purchasing 9 blocks

### Generation Partners Program in Jefferson County

Consumers who "generate" electricity by means of renewable resources (solar, wind, etc.) are able to sell their power back to Appalachian Electric Cooperative & TVA through the "Generation Partners" Program. Currently this program has 3 residential partners in Jefferson County (compared to 0 partners in 2009). All installations are solar power, with a combined generation capacity of 28,400 Kwh of renewable energy.

Solar Generation Partner in Jefferson City – generating capacity is 2,500 Kwh

Solar Generation Partner in Piedmont – generating capacity is 9,000 Kwh

Solar Generation Partner in Dandridge – generating capacity is 16,900 Kwh

## Jefferson County School System Power Consumption

2007-2008 school year (August – July): 10,237,236 Kilowatt Hours  
 2008-2009 school year: 10,166,976 Kilowatt Hours

Net Savings: 70,260 Kwh. **(Represents a 1% reduction in energy usage.)**

*Note: the above numbers do not reflect the energy consumption at Rush Strong School, a customer of Knoxville Utilities Board. We are adding that information as a new entry into this 2010 report. Moving forward, we will include all Jefferson County Schools in a single category.*

Rush Strong School (k-8)

2008-2009 school year: 1,482,798 Kilowatt Hours

Jefferson County Schools spend approximately \$1.49 per square foot for energy needs. This cost is fairly average for the East Tennessee area, based on age of buildings and equipment, efficiency of HVAC and other maintenance concerns. A possible goal would be to reduce this expense to \$1.27 per square foot. That would represent a 15% reduction, a figure commonly cited as reachable by implementing “no cost” behavioral changes in schools—such as keeping doors closed, computer monitors off when unused, and lights off in unoccupied rooms. Studies show that a new school, built to energy efficient standards and serving 1,200 students, would achieve an approximate cost of .86 cents per square ft.

The following table breaks down 2008-2009 electricity consumption, natural gas and propane consumption by school.

|                              | Electricity (kwh) | Natural Gas (Therms) | Propane (Gallons) |
|------------------------------|-------------------|----------------------|-------------------|
| <b>Dandridge Elementary</b>  | 798,051           | 6,210                | 0                 |
| <b>Jefferson Elementary</b>  | 557,863           | 22,580               | 0                 |
| <b>Jefferson Middle</b>      | 816,203           | 22,400               | 0                 |
| <b>Jefferson High</b>        | 3,536,217         | 70,550               | 0                 |
| <b>Maury Middle</b>          | 708,163           | 15,740               | 0                 |
| <b>New Market Elementary</b> | 766,563           | 0                    | 0                 |
| <b>Piedmont Elementary</b>   | 620,963           | 0                    | 1,960             |
| <b>Rush Strong</b>           | 1,497,681         | 0                    | 3,942             |
| <b>Talbott Elementary</b>    | 486,123           | 0                    | 8,485             |
| <b>White Pine</b>            | 896,355           | 9,970                | 0                 |
| <b>All Portable Classes</b>  | 965,592           | 0                    | 0                 |
| <b>* Combined Totals</b>     | <b>11,649,774</b> | <b>147,450</b>       | <b>14,388</b>     |

*Data for the above chart compiled by members of the Environment Foundation Team, based on utility records.*

### Propane consumption trends in gallons of propane consumed by local schools

|                            | 2006   | 2007   | 2008   |
|----------------------------|--------|--------|--------|
| <b>Piedmont Elementary</b> | 1,431  | 2,016  | 1,960  |
| <b>Rush Strong</b>         | 2,989  | 4,314  | 3,942  |
| <b>Talbott Elementary</b>  | 8,314  | 10,925 | 8,485  |
| <b>Combined totals</b>     | 12,734 | 17,255 | 14,387 |

### Natural Gas Consumption trends in Therms of natural gas for local schools

|                             | 2005    | 2006    | 2007    | 2008    |
|-----------------------------|---------|---------|---------|---------|
| <b>Dandridge Elementary</b> | 7,410   | 6,640   | 5,560   | 6,210   |
| <b>Jefferson Elementary</b> | 19,070  | 17,580  | 19,110  | 22,580  |
| <b>Jefferson Middle</b>     | 20,390  | 18,220  | 18,660  | 22,400  |
| <b>Jefferson High</b>       | 52,410  | 49,930  | 58,080  | 70,550  |
| <b>Maury Middle</b>         | 13,650  | 14,450  | 15,100  | 15,740  |
| <b>White Pine</b>           | 17,040  | 19,230  | 16,860  | 9,970   |
| <b>Combined Totals</b>      | 129,970 | 126,050 | 133,370 | 147,450 |

The following table shows the total combined costs of all utilities; electric, natural gas, propane, water and wastewater (where applicable) for all Jefferson County Schools.

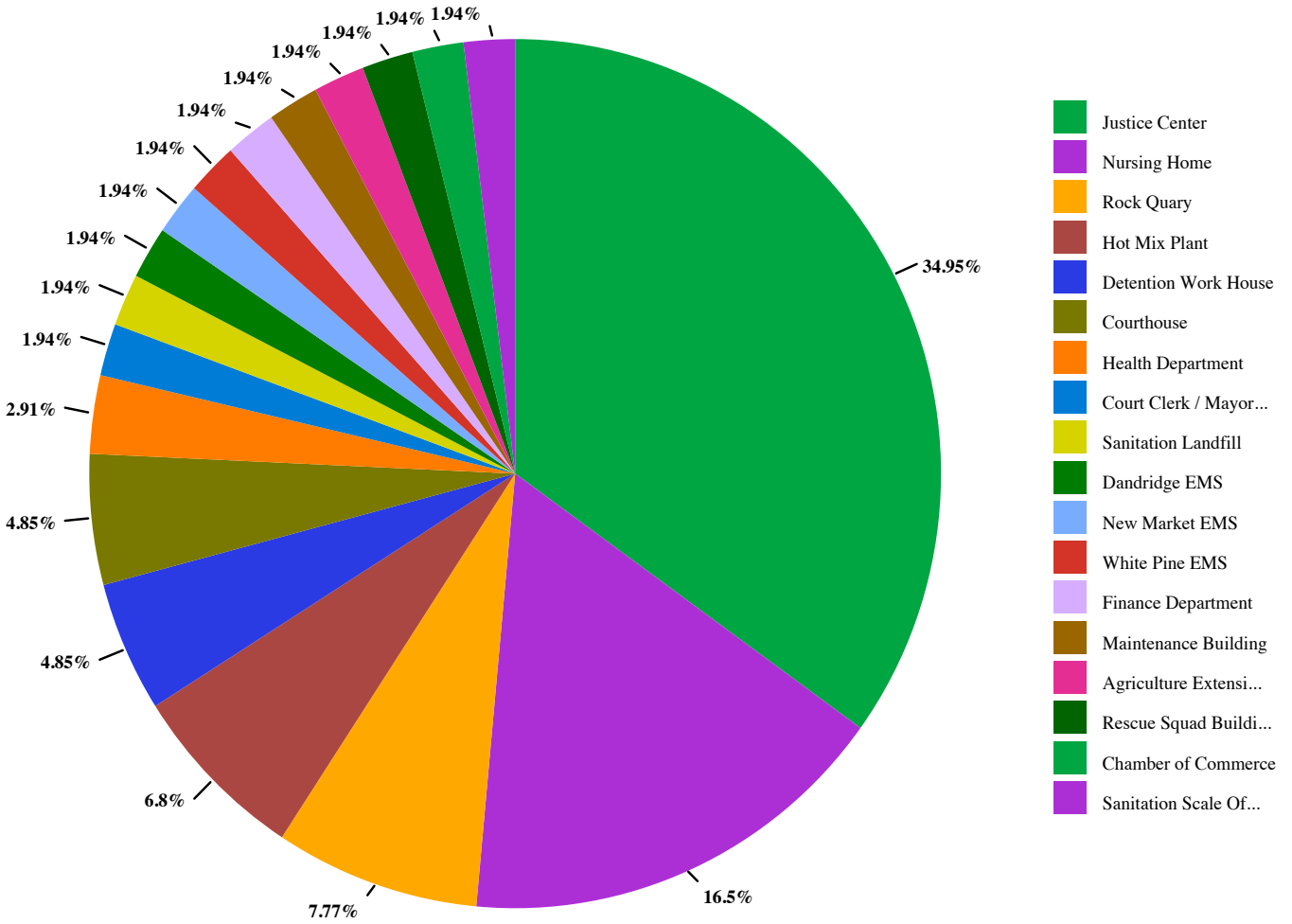
|                                | 2008-2009 Total Utility Costs |
|--------------------------------|-------------------------------|
| <b>Dandridge Elementary</b>    | \$100,430.00                  |
| <b>Jefferson Elementary</b>    | \$98,260.00                   |
| <b>Jefferson Middle</b>        | \$118,813.00                  |
| <b>Jefferson County High</b>   | \$4379,532.00                 |
| <b>Maury Middle</b>            | \$98,348.00                   |
| <b>New Market Elementary</b>   | \$85,583.00                   |
| <b>Piedmont Elementary</b>     | \$73,871.00                   |
| <b>Rush Strong</b>             | \$150,546.00                  |
| <b>Talbott Elementary</b>      | \$52,835.00                   |
| <b>White Pine</b>              | \$98,537.00                   |
| <b>All Portable Classrooms</b> | \$93,537.00                   |
| <b>Combined Totals</b>         | \$1,348,220.00                |

*Data for the above charts compiled by members of the Environment Foundation Team, based on utility records.*

### Biofuels Use in Jefferson County's Fleet of Government Vehicles

Currently (2010), no vehicles in Jefferson County's fleet (including school buses) operate on biofuels.

### Energy Consumption for Jefferson County Government Facilities (as percentages)



*Appalachian Electric Cooperative, March 2010*

# Jefferson County Land Statistics

## Forest Cover

|                             |                                  |
|-----------------------------|----------------------------------|
| Jefferson County total area | 274 square miles (175,360 acres) |
| Forested area               | 115 square miles (73,350 acres)  |
| Percent forest cover        | 42%                              |

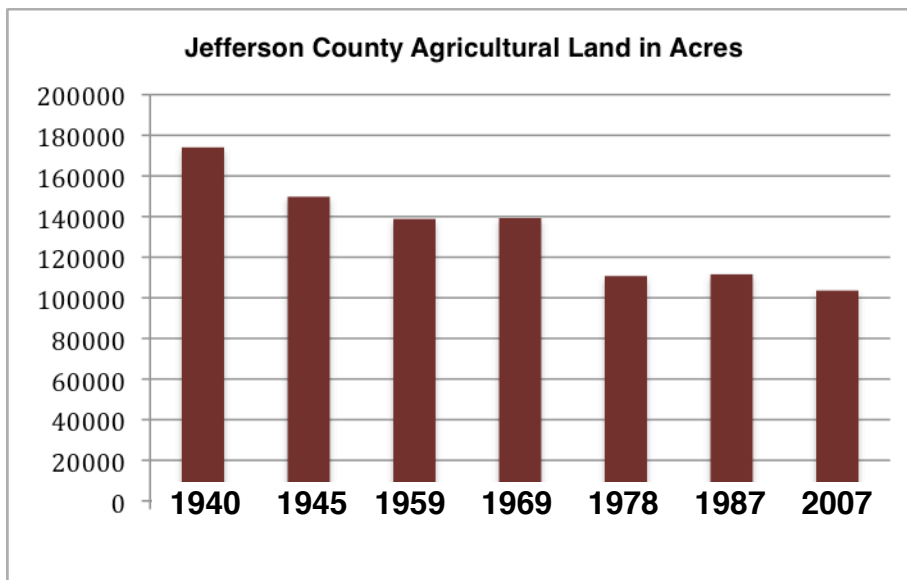
*USDA Forest Service, Southern Research Station, FIA Estimates, 2007*

## Impervious Cover

Of Jefferson County’s total 175,360 acres of land (not counting the lake areas), **2,139** are covered with impervious surfaces (roadways, rooftops, parking areas, etc.), which do not allow penetration of water into the earth.

*Source: National Land Cover 2001 Data Set, USGS*

## Agricultural Land



During the time frame shown, **approximately 40 percent** of Jefferson County’s farmland was converted to other uses. In 1940, there were 172,135 acres of farmland; in 2007, there were 101,585.

*National Agricultural Statistics Service and 1992 Census of Agriculture*

## Conservation Easements

Easements are parcels of land that are kept from development and preserved permanently as wilderness, agricultural lands, or open space. The government or a specific organization, called a “land trust,” helps landowners manage these lands in perpetuity. Last year, there were two areas totaling 828 acres in trust in our county. In 2010, Jefferson County has four areas totaling **986 acres** in trust.

*Jefferson County Assessor, 2010*

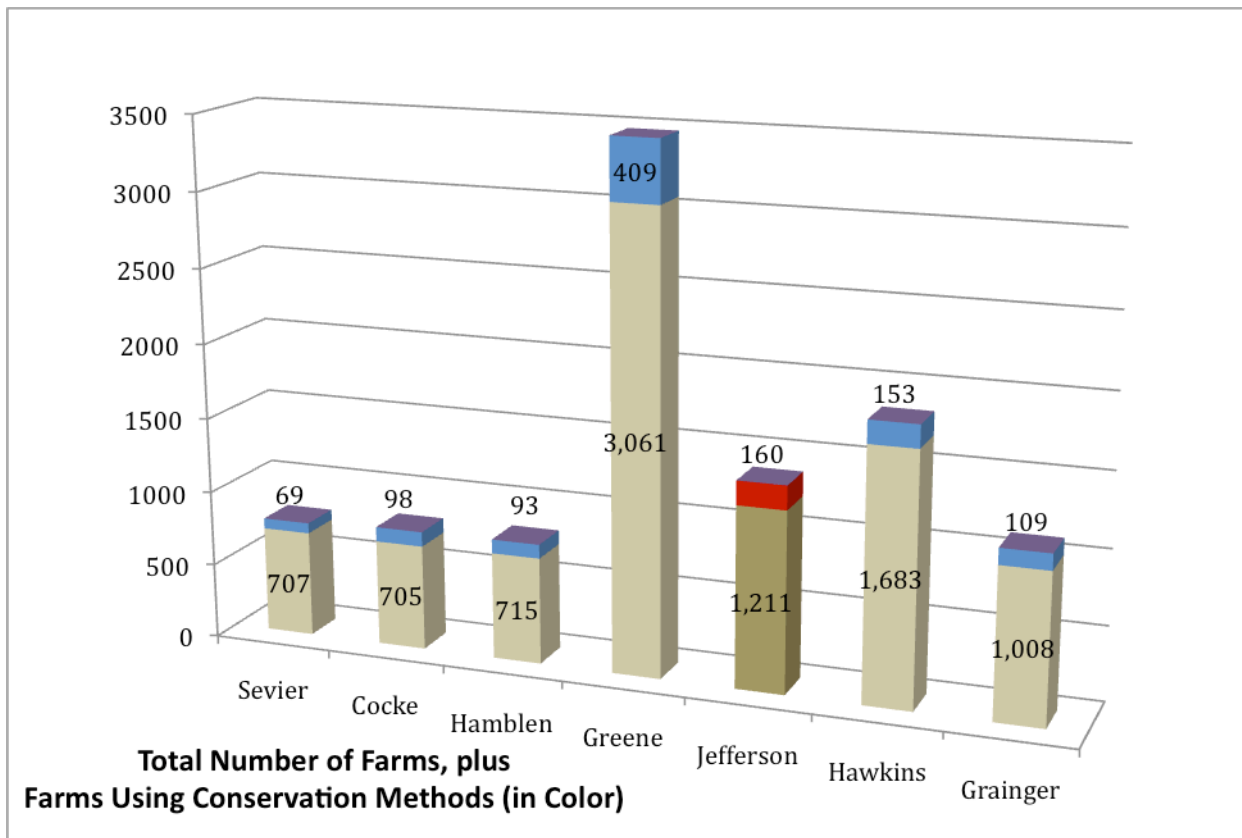
### Conservation Practices in Jefferson County

From October 2008 through September 2009, the Natural Resources Conservation Service provided \$43,060 for a variety of conservation practices in Jefferson County under the Environmental Quality Incentive Program (EQIP). Funding went toward projects such as conversion of pasture to native warm season grasses, watering facilities, exclusion fencing, pipeline, and heavy use areas.

During the same time period, the Tennessee Department of Agriculture provided a total of \$45,311 for local projects including the installation of watering facilities, cross fencing, exclusion fencing, pipeline, heavy use areas, and critical area treatment.

*District Conservationist, Natural Resources Conservation Service, 2010*

### Farms Certified as Using Available Conservation Methods

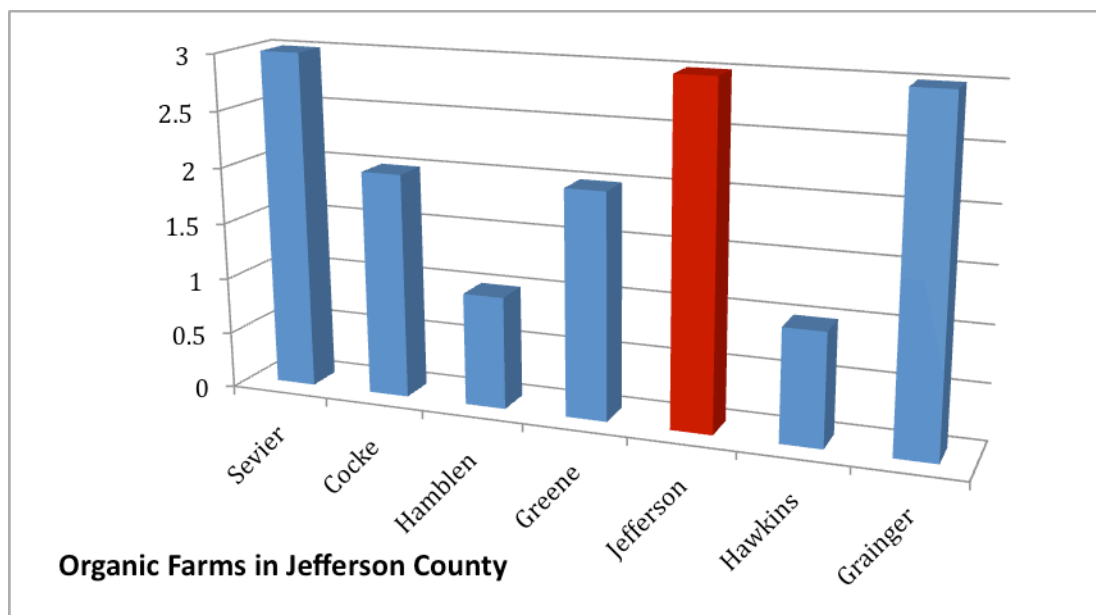


Jefferson County farmers are starting to find that using the best available conservation methods is not only environmentally friendly, but can also reduce operating costs by minimizing the need for pesticides and herbicides through practices such as crop rotation and no-till farming techniques.

The chart above shows the total number of farms compared to the number certified by the Department of Agriculture as using good conservation methods. Jefferson County compares favorably with other neighboring counties in this statistic.

*Source: National Agriculture Statistics Service 2007 Census of Agriculture*

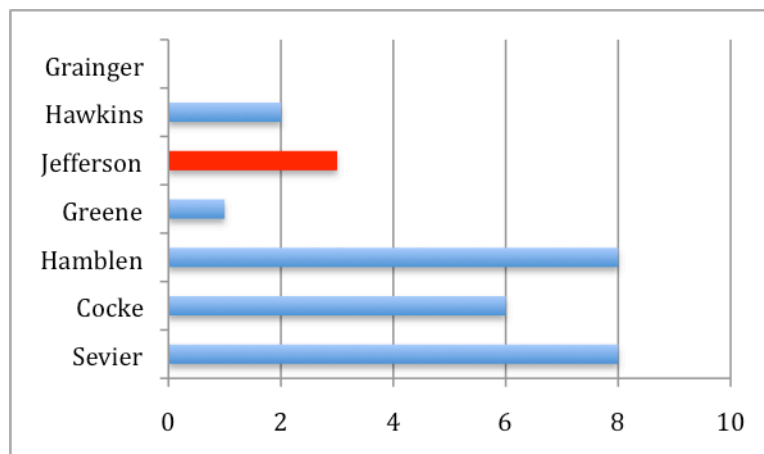
## Organic Agriculture – Number of Farms used only for Organic Production



Organic agriculture is now a familiar term, but organic food production still hasn't taken widespread hold in East Tennessee. Organic farming holds environmental benefits over conventional farming, in that harmful chemicals found in pesticides are not present in runoff entering streams, rivers, and lakes. Also, chemicals used in conventional farming can deplete soil, making it less fertile over time. Organic farming methods build soil life and structure, increasing fertility. Jefferson County organic farmers are keeping pace with those in neighboring counties and more farms are expected to be certified organic as demand increases.

*Source: National Agriculture Statistics Service 2007 Census of Agriculture*

## Pollution Control Permit Violations for Underground Storage Tanks



In 2009 TDEC issued permit violation enforcement orders for underground storage tanks at three locations in Jefferson County, an increase from the two TDEC orders issued in 2008. However, as compared to other regional counties, there is no reason to believe that the increase is a significant cause for concern at this time.

*TDEC Enforcement Database, 2010*

## Evaluating Jefferson County's Development Rules

The Codes and Ordinance Worksheet allows users to evaluate local development rules against the Center for Watershed Protection's "Model Principles of Better Site Design." It is designed to help communities see how they are doing in terms of managing growth while minimizing impacts to water quality and other resources. The score sheet below was completed with guidance from TVA and the Local Planning Assistance Office as part of the Growth Readiness Workshop Series.

### Jefferson County Growth Readiness Workshops, 2008

Jefferson County    Baneberry    Dandridge    Jeff City    New Mkt    White Pine    **Max Points**    County Avg.    Needs Improvement

## STREETS AND PARKING

|   |           |          |           |           |           |           |           |             |                           |
|---|-----------|----------|-----------|-----------|-----------|-----------|-----------|-------------|---------------------------|
| <b>1. Street Width</b>                                      |           |          |           |           |           |           |           |             |                           |
| a. Pavement 18-22 ft wide in low density developments       | 4         | 0        | 4         | 0         | 4         | 0         | <b>4</b>  | <b>2</b>    | WP, Jeff                  |
| b. Parking lanes serve as traffic lanes in higher density   | 0         | 0        | 0         | 0         | 0         | 0         | <b>3</b>  | <b>0</b>    | n/a                       |
| <b>2. Street Length</b>                                     |           |          |           |           |           |           |           |             |                           |
| a. Promote efficient street layouts reducing overall length | 0         | 0        | 1         | 1         | 0         | 0         | <b>1</b>  | <b>.333</b> | JC, Baneberry, NM, WP     |
| <b>3. Right-of-Way Width</b>                                |           |          |           |           |           |           |           |             |                           |
| a. Minimum right-of-way (ROW) width < 45 ft                 | 0         | 0        | 0         | 0         | 3         | 0         | <b>3</b>  | <b>.5</b>   | All except NM             |
| b. Allow utilities under paved section of ROW               | 0         | 0        | 0         | 0         | 1         | 1         | <b>1</b>  | <b>.333</b> |                           |
| <b>4. Cul-de-Sacs</b>                                       |           |          |           |           |           |           |           |             |                           |
| a. Minimum cul-de-sacs radius < 35 ft or < 46 ft            | 0         | 1        | 1         | 0         | 0         | 1         | <b>3</b>  | <b>.5</b>   | Consult EMS               |
| b. Landscaped island permitted within the cul-de-sac        | 1         | 0        | 1         | 1         | 1         | 0         | <b>1</b>  | <b>.667</b> | Baneberry, WP             |
| c. Hammerheads and other alternatives allowed               | 1         | 0        | 0         | 1         | 1         | 1         | <b>1</b>  | <b>.667</b> | Looped Road               |
| <b>5. Vegetated Open Channels</b>                           |           |          |           |           |           |           |           |             |                           |
| a. Curb & gutters not required for most residential streets | 2         | 2        | 0         | 2         | 2         | 0         | <b>2</b>  | <b>1.33</b> | Dandridge, WP             |
| b. Criteria established for swales to treat storm water     | 0         | 0        | 0         | 0         | 0         | 2         | <b>2</b>  | <b>.333</b> | All except WP             |
| <b>6. Parking Ratios</b>                                    |           |          |           |           |           |           |           |             |                           |
| a. Professional office minimum < 3 spaces per 1000 gsf      | 1         | 1        | 0         | 1         | 1         | 1         | <b>1</b>  | <b>.833</b> | Dandridge                 |
| b. Shopping center minimum <= 4.5 space per 1000 gsf        | 0         | 0        | 1         | 1         | 1         | 1         | <b>1</b>  | <b>.667</b> | JC, Baneberry             |
| c. Single family residential <= 2 spaces per home           | 0         | 1        | 1         | 1         | 1         | 1         | <b>1</b>  | <b>.833</b> | JC                        |
| d. Set as maximum or median rather than minimum             | 0         | 0        | 0         | 0         | 0         | 0         | <b>2</b>  | <b>0</b>    | Set Max Impervious?       |
| <b>7. Parking Codes</b>                                     |           |          |           |           |           |           |           |             |                           |
| a. Shared parking arrangements promoted                     | 0         | 0        | 0         | 0         | 0         | 0         | <b>1</b>  | <b>0</b>    |                           |
| b. Model shared parking agreements provided                 | 0         | 0        | 0         | 0         | 0         | 0         | <b>1</b>  | <b>0</b>    |                           |
| c. Parking ratios reduced if shared parking in place        | 0         | 0        | 0         | 0         | 0         | 0         | <b>1</b>  | <b>0</b>    |                           |
| d. Parking ratios reduced when mass transit is nearby       | 0         | 0        | 0         | 0         | 0         | 0         | <b>1</b>  | <b>0</b>    | n/a                       |
| <b>8. Parking Lots</b>                                      |           |          |           |           |           |           |           |             |                           |
| a. Minimum stall width <= 9 ft                              | 0         | 0        | 0         | 1         | 0         | 0         | <b>1</b>  | <b>.167</b> |                           |
| b. Minimum stall length <= 18 ft                            | 0         | 0        | 0         | 1         | 1         | 1         | <b>1</b>  | <b>.5</b>   |                           |
| c. > 30% of spaces in large lots are smaller for compacts   | 0         | 0        | 0         | 0         | 0         | 0         | <b>1</b>  | <b>0</b>    |                           |
| d. Pervious materials can be used for spillover parking     | 2         | 0        | 0         | 2         | 2         | 0         | <b>2</b>  | <b>1</b>    | Baneberry, Dandridge, WP  |
| <b>9. Structured Parking</b>                                |           |          |           |           |           |           |           |             |                           |
| a. Incentives for parking garages rather than surface lots  | 0         | 0        | 0         | 0         | 0         | 0         | <b>1</b>  | <b>0</b>    |                           |
| <b>10. Parking Lot Runoff</b>                               |           |          |           |           |           |           |           |             |                           |
| a. Minimum % of a parking lot must be landscaped            | 0         | 0        | 2         | 0         | 0         | 0         | <b>2</b>  | <b>.333</b> | All but JC, Baneberry, NM |
| b. Practices allowed in landscaped areas or setbacks        | 2         | 0        | 2         | 0         | 0         | 2         | <b>2</b>  | <b>1</b>    |                           |
| <b>SUBTOTALS</b>  | <b>13</b> | <b>5</b> | <b>13</b> | <b>12</b> | <b>18</b> | <b>11</b> | <b>40</b> | <b>12</b>   |                           |

Jefferson Bane- Dand- Jeff New White Max County  
County berry ridge City Mkt Pine Points Avg. Comments

## LOT DESIGN

|   | Jefferson County | Banberry | Dandridge | Jeff City | New Mkt   | White Pine | Max Points | County Avg.  | Comments                                    |
|---|------------------|----------|-----------|-----------|-----------|------------|------------|--------------|---|
| <b>1. Open Space Design</b>                               |                  |          |           |           |           |            |            |              |   |
| a. Open space or cluster development designs allowed      | 3                | 3        | 3         | 3         | 3         | 3          | <b>3</b>   | <b>3</b>     | Ordinance needed /already achieved          |
| b. Rules conserve land & reduce imperviousness            | 0                | 0        | 1         | 0         | 0         | 0          | <b>1</b>   | <b>.167</b>  |   |
| c. Process same as for conventional development           | 1                | 1        | 1         | 1         | 1         | 1          | <b>1</b>   | <b>1</b>     | already achieved                            |
| d. Open space or cluster design is by-right               | 1                | 0        | 0         | 1         | 1         | 1          | <b>1</b>   | <b>.667</b>  | already achieved                            |
| e. Flexible site design criteria available for developers | 2                | 0        | 2         | 0         | 0         | 2          | <b>2</b>   | <b>1</b>     | already achieved                            |
| <b>2. Setbacks and Frontages</b>                          |                  |          |           |           |           |            |            |              |   |
| a. Irregular lot shapes allowed                           | 1                | 0        | 1         | 1         | 1         | 1          | <b>1</b>   | <b>.833</b>  | already achieved                            |
| b. Min front setback for ½ acre residential lot <= 20 ft  | 0                | 1        | 0         | 0         | 0         | 0          | <b>1</b>   | <b>.167</b>  | already achieved                            |
| c. Min rear setback for ½ acre residential lot <= 25 ft   | 1                | 0        | 1         | 1         | 1         | 1          | <b>1</b>   | <b>.833</b>  | already achieved                            |
| d. Min side setback for ½ acre residential lot <= 8 ft    | 1                | 0        | 0         | 1         | 1         | 0          | <b>1</b>   | <b>.5</b>    | already achieved                            |
| e. Min frontage for ½ acre residential lot < 80 ft        | 2                | 0        | 2         | 2         | 2         | 2          | <b>2</b>   | <b>1.667</b> | already achieved                            |
| <b>3. Sidewalks</b>                                       |                  |          |           |           |           |            |            |              |   |
| a. Minimum sidewalk width <= 4 ft                         | 2                | 0        | 2         | 0         | 0         | 2          | <b>2</b>   | <b>1</b>     | achieved                                    |
| b. Sidewalks not always required on both sides of streets | 2                | 0        | 0         | 0         | 0         | 2          | <b>2</b>   | <b>.667</b>  |   |
| c. Sidewalks generally sloped so they drain to front yard | 0                | 0        | 0         | 0         | 0         | 0          | <b>1</b>   | <b>0</b>     |   |
| d. Alt pedestrian networks can substitute for sidewalks   | 0                | 0        | 0         | 0         | 0         | 1          | <b>1</b>   | <b>.167</b>  |   |
| <b>4. Driveways</b>                                       |                  |          |           |           |           |            |            |              |   |
| a. Min. drive width <= 9 ft (1 lane) or <= 18 ft (2 lane) | 0                | 0        | 0         | 0         | 0         | 0          | <b>2</b>   | <b>0</b>     | need ordinance to allow and perhaps require |
| b. Pervious material allowed for single family driveways  | 2                | 0        | 2         | 2         | 2         | 2          | <b>2</b>   | <b>1.667</b> | need ordinance to allow and perhaps require |
| c. "Two track" design allowed for single family driveways | 1                | 0        | 0         | 0         | 1         | 1          | <b>1</b>   | <b>.667</b>  | need ordinance to allow and perhaps require |
| d. Shared driveways permitted in residential development  | 1                | 0        | 0         | 0         | 1         | 1          | <b>1</b>   | <b>.667</b>  | need ordinance to allow and perhaps require |
| <b>5. Open Space Management</b>                           |                  |          |           |           |           |            |            |              |   |
| a. Requirements for associations to manage open space     | 2                | 0        | 2         | 0         | 0         | 2          | <b>2</b>   | <b>1</b>     |   |
| b. Open space must be consolidated into larger units      | 0                | 0        | 0         | 0         | 0         | 0          | <b>1</b>   | <b>0</b>     |   |
| c. Minimum % of space must be managed in natural state    | 0                | 0        | 0         | 0         | 0         | 0          | <b>1</b>   | <b>0</b>     |   |
| d. Defined uses for space in residential developments     | 0                | 0        | 0         | 0         | 0         | 0          | <b>1</b>   | <b>0</b>     |   |
| e. Third party management allowed                         | 1                | 0        | 0         | 0         | 0         | 1          | <b>1</b>   | <b>.333</b>  |   |
| <b>6. Rooftop Runoff</b>                                  |                  |          |           |           |           |            |            |              |   |
| a. Rooftop runoff can be discharged to yard               | 2                | 0        | 2         | 2         | 2         | 2          | <b>2</b>   | <b>1.667</b> | allowed                                     |
| b. Temporary ponding on front yards or rooftops allowed   | 0                | 0        | 0         | 2         | 0         | 2          | <b>2</b>   | <b>.667</b>  | allowed                                     |
| <b>SUBTOTALS</b>  | <b>25</b>        | <b>5</b> | <b>19</b> | <b>18</b> | <b>16</b> | <b>27</b>  | <b>36</b>  | <b>18.3</b>  |   |

**NATURAL AREAS**

|   | Jefferson County | Bane- berry | Dand- ridge | Jeff City | New Mkt | White Pine | Max Points | County Avg. | Comments  |
|---|------------------|-------------|-------------|-----------|---------|------------|------------|-------------|---|
| <b>1. Buffer Systems</b>                                  |                  |             |             |           |         |            |            |             |   |
| a. Stream buffer ordinance exists                         | 0                | 0           | 0           | 0         | 0       | 0          | 2          | 0           |   |
| b. Minimum buffer width > 75 ft                           | 0                | 0           | 0           | 0         | 0       | 0          | 1          | 0           | Width determined by context   |
| c. Includes wetlands, steep slopes or 100-year floodplain | 0                | 0           | 0           | 0         | 0       | 0          | 1          | 0           | also include streams and lakeshores.                                    |
| <b>2. Buffer Maintenance</b>                              |                  |             |             |           |         |            |            |             |   |
| a. Native vegetation required in part of buffer           | 0                | 0           | 0           | 0         | 0       | 0          | 2          | 0           |   |
| b. Allowable uses are outlined                            | 0                | 0           | 0           | 0         | 0       | 0          | 1          | 0           | Exclude livestock   |
| c. Enforcement and education mechanisms specified         | 0                | 0           | 0           | 0         | 0       | 0          | 1          | 0           |   |
| <b>3. Clearing and Grading</b>                            |                  |             |             |           |         |            |            |             |   |
| a. Natural vegetation preservation required/encouraged    | 0                | 0           | 0           | 0         | 0       | 0          | 2          | 0           |   |
| b. Clearing trees from new septic fields not required     | 1                | 0           | 1           | 1         | 1       | 1          | 1          | .833        |   |
| c. Minimize topographic alterations (NEW)                 |                  |             |             |           |         |            |            |             |   |
| d. Preserve native soils (save and replace) (NEW)         |                  |             |             |           |         |            |            |             |   |
| <b>4. Tree Conservation</b>                               |                  |             |             |           |         |            |            |             |   |
| a. Preservation of forests or specimen trees required     | 0                | 0           | 0           | 0         | 0       | 0          | 2          | 0           | Including Ridgelines  |
| b. Plans prevent clearing vegetation during construction  | 0                | 0           | 0           | 0         | 0       | 0          | 1          | 0           |   |
| c. Reforestation - Urban and Rural (NEW)                  |                  |             |             |           |         |            |            |             |   |
| <b>5. Land Conservation Incentives</b>                    |                  |             |             |           |         |            |            |             |   |
| a. Incentives to conserve non-regulated land              | 0                | 0           | 2           | 0         | 0       | 0          | 2          | .333        |   |
| b. Flexibility to meet restrictions                       | 0                | 0           | 0           | 0         | 0       | 0          | 2          | 0           | Flexibility/Education; Review Plans for large tracts                    |
| <b>6. Stormwater Outfalls</b>                             |                  |             |             |           |         |            |            |             |   |
| a. Storm water treated for quality before discharge       | 0                | 0           | 0           | 0         | 0       | 0          | 2          | 0           |   |
| b. Effective design criteria for storm water BMPs         | 0                | 0           | 0           | 0         | 0       | 0          | 1          | 0           |   |
| c. Storm water pretreated before discharge to wetland     | 0                | 0           | 1           | 0         | 0       | 0          | 1          | .167        |   |
| d. Floodplain ordinance restricts floodplain development  | 2                | 0           | 2           | 2         | 2       | 2          | 2          | 1.667       |   |
| <b>7. Agriculture Preservation (NEW)</b>                  |                  |             |             |           |         |            |            |             |   |
| <b>8. Green Infrastructure (NEW)</b>                      |                  |             |             |           |         |            |            |             |   |
|   |                  |             |             |           |         |            |            |             | Develop a GI Plan that takes ecologically sensitive areas into account. |
| <b>SUBTOTALS</b>  | 3                | 0           | 6           | 3         | 3       | 3          | 24         | 3           |   |

**TOTAL SCORES**

41    10    38    33    37    41    100    33.3

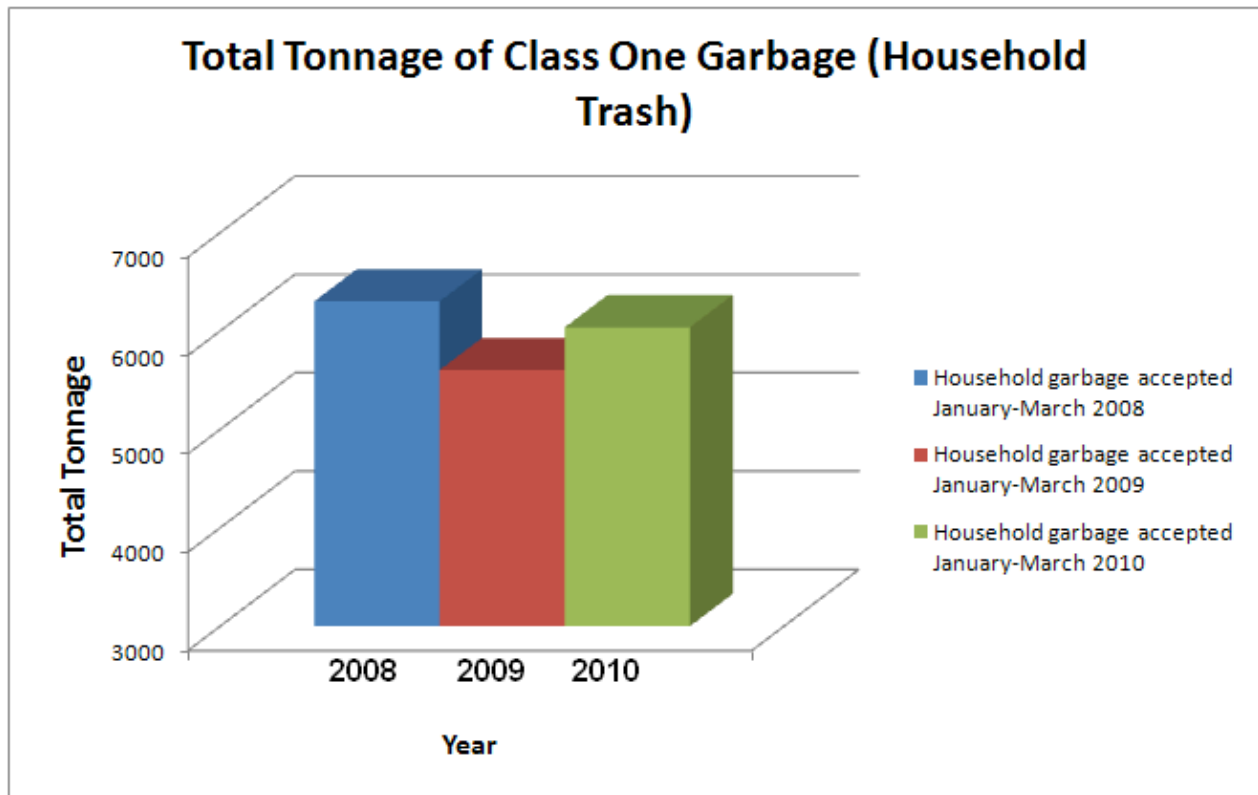
**90-100 points: Leader;    60-89 points: Opportunities for Improvement;    <60 points: Serious Reform Needed**

### Jefferson County Landfill

Jefferson County's current landfill was built in 1993 with the expectation that it would provide sufficient capacity for 30 years. Since that time, there have been 11 new permits for height added. Newer, more efficient equipment for compacting trash has offered an increase of 52 days (per year) longer. At present, the Jefferson County Sanitation Department expects this landfill to last yet another 30 years.

### Class One Garbage (Household Trash)

During the first quarter of 2008, the landfill accepted 6,301 tons of class one garbage from Jefferson County. For the same period in 2009, it accepted 5,602 tons, or 699 less than the previous year's first quarter total. In the first quarter of 2010, it accepted 6037 tons. This is 435 tons more than in 2009 but 264 tons less than in 2008.



### Hazardous Waste Collection

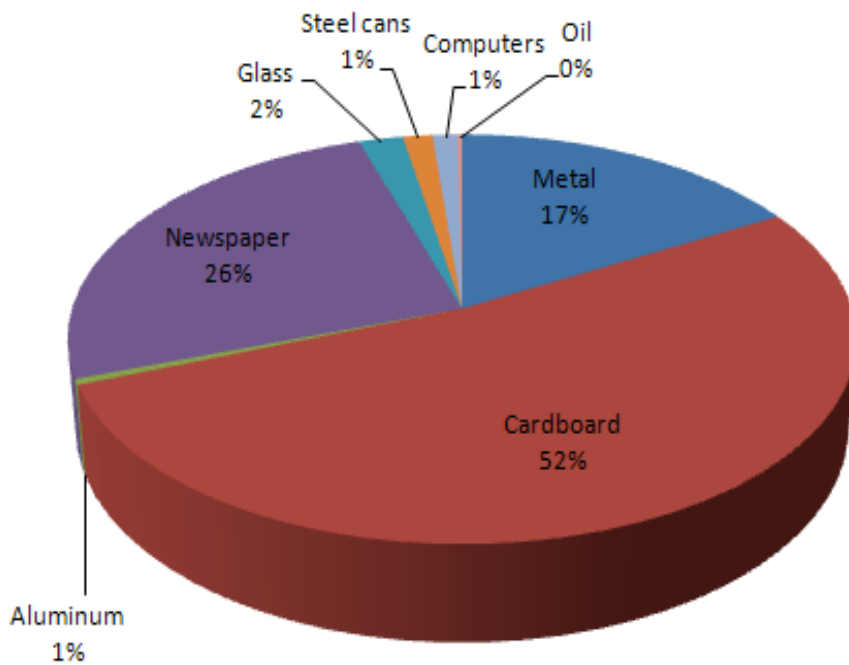
The County Sanitation Department was able to offer one hazardous waste collection day in 2009, at which time they accepted 1.9 tons of paint, oil, batteries, televisions, computers, and household insecticides. (In 2008, 13.9 tons were accepted.)

## Recycling Through the Jefferson County Sanitation Department

The Jefferson County Sanitation Department reports that recycling volume during the first quarter of 2010 was higher than the same period in 2009, taking in 45 more tons of recyclable materials shipped off for processing (429 tons total). This continues the upward trend seen in 2009 over 2008 totals. In addition, 5 tons of computers and 1 ton of oil were recycled in the 1st quarter.

|                                | <i>Tons shipped<br/>Jan-Mar 2008</i> | <i>Tons shipped<br/>Jan-Mar 2009</i> | <i>Tons shipped<br/>Jan-Mar 2010</i> |
|--------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| <b>Metal</b>                   | 84.5                                 | 80.03                                | 72                                   |
| <b>Cardboard</b>               | 45                                   | 192.5                                | 224.5                                |
| <b>Aluminum</b>                | 1.65                                 | 1.35                                 | 2                                    |
| <b>Newspaper</b>               | 108.5                                | 110                                  | 109.5                                |
| <b>Plastic</b>                 | 0                                    | 0                                    | 0                                    |
| <b>Glass</b>                   | 0                                    | 0                                    | 9                                    |
| <b>Steel Cans (“Tin cans”)</b> | 0                                    | 0                                    | 6                                    |
| <b>Computers</b>               | -                                    | -                                    | 5                                    |
| <b>Oil</b>                     | -                                    | -                                    | 1                                    |
| <b>Total</b>                   | <b>239.65</b>                        | <b>383.88</b>                        | <b>429.00</b>                        |

Recycling Collected Jan-Mar 2010



## State Scenic Rivers

The Scenic Rivers Program was established in 1968 with the passage of the Tennessee Scenic Rivers Act. Since passage of this act, the General Assembly has designated sections of 13 rivers as State Scenic Rivers. Many of these Scenic Rivers are managed cooperatively with other local, state and federal agencies as well as with non-governmental organizations. The Scenic Rivers Program seeks to preserve valuable selected rivers, or sections thereof, in their free-flowing natural or scenic conditions and to protect their water quality and adjacent lands. Jefferson County has **one stream** with this designation, **Tuckahoe Creek**. The entire creek is a Class III - Developed River Area.

*Tennessee Department of Environment and Conservation*

## Exceptional Tennessee Waters

As well, a **portion of the Holston River** that flows through Jefferson County has been placed on the State's list of "Exceptional Tennessee Waters." This classification includes water bodies with good water quality, important ecological values, valuable recreational uses, and outstanding scenery. The area so designated flows **from the confluence with the French Broad River to McBee Island**. The basis for inclusion on this list is its being a habitat for the federal endangered Pink Mucket and the federal threatened Snail Darter.

*Division of Water Pollution Control/July 2008*

## Bacteriological Advisories for Jefferson County Streams

Consistent with EPA guidance, any stream or reservoir in Tennessee with an advisory is assessed as not meeting the recreational designated use. Clearly, if fishermen cannot safely eat the fish they catch, the water body is not supporting its goal to be fishable. Likewise, streams and lakes with high levels of bacteria are not suitable for recreational activities such as swimming or wading.

| <i>Stream</i>  | <i>Portion</i>                         |
|----------------|--|
| Leadvale Creek | Douglas Lake to headwaters (1.5 miles) |

*TN Department of Environment and Conservation, 2008, Bacteriological and Fishing Advisories in Tennessee*

## Leading Sources of Water Quality Problems for Rivers, Streams, and Creeks

| <i>Source</i>                          | <i>Percent of Jefferson County's Water Bodies Affected</i> |
|--|--|
| Agriculture                            | 37%  |
| Hydromodification/Habitat Modification | 33%  |
| Construction                           | 22%  |
| Septic Systems                         | 22%  |
| Resource Extraction                    | 19%  |

*United States Environmental Protection Agency, 1999*

## Polluted Streams in Jefferson County

—TDEC, Final Year 2008 303(d) List

| Affected Water Body | Miles Impaired | CAUSE / TMDL Priority  | Pollutant Source   | COMMENTS   |
|---------------------|----------------|--|--|--|
| LOST CREEK          | 26.8           | Loss of biological integrity due to siltation H<br>Escherichia coli H  | Pasture Grazing<br>Septic Tanks  | Stream is Category 5. (One or more uses impaired.)   |
| BEAVER CREEK        | 21.0           | Escherichia coli H   | Pasture Grazing  | Stream is Category 5. (One or more uses impaired.)   |
| HOLSTON RIVER       | 26.9           | Low DO L<br>Habitat loss due to stream flow alteration NA  | Upstream Impoundment   | Below Cherokee Reservoir. Category 5 (one or more uses impaired), but flow alteration is 4c (impact not caused by a pollutant). Provides habitat for the federally listed pink mucket pearly mussel ( <i>Lampsilis abrupta</i> ). TVA has attempted to improve dissolved oxygen and flow levels.   |
| MOSSY CREEK         | 9.1            | Zinc M<br>Loss of biological integrity due to siltation H<br>Escherichia coli H                                  | Collection System Failure<br>Discharges from MS4 area<br>Subsurface Mining | Stream is Category 5. (One or more uses impaired.)   |
| LEADVALE CREEK      | 4.4            | Escherichia coli M   | Pasture Grazing  | Water contact advisory. Stream is Category 5. One or more uses impaired.   |
| CLEAR CREEK         | 3.3            | Escherichia coli NA  | Pasture Grazing  | Stream is Category 4a. Impaired, but EPA has approved a pathogen TMDL that addresses the pollutant.  |
| CLEAR CREEK         | 13.6           | Escherichia coli NA  | Pasture Grazing  | Stream is Category 4a. EPA has approved a pathogen TMDL that addresses the known pollutant.  |
| CLEAR CREEK         | 13.6           | Nutrients  | Pasture Grazing  | Originally assessed as affected by nutrients from visual assessment of algae during a biological survey. In 2005, TDEC collected a SQSH at mile 2.7 (Rainwater School Road). The results of the survey generated a passing Index score of 32. Four EPT genera and 31 total genera were documented. The stream will remain listed for pathogens, but still appears to have improved and no longer has an obvious algae problem. |
| DUMPLIN CREEK       | 19.1           | Loss of biological integrity due to siltation NA<br>Physical Substrate Habitat Alterations<br>Escherichia coli M | Pasture Grazing<br>Land Development<br>Channelization                      | Stream is Category 5. (One or more uses impaired.) EPA approved a TMDL for some of the known pollutants.   |
| SARTAIN CREEK       | 4.4            | Loss of biological integrity due to siltation H<br>Physical Substrate Habitat Alterations H                      | Pasture Grazing<br>Unrestricted Cattle Access                              | Stream is Category 5. (One or more uses impaired.)   |
| CARTER BRANCH       | 3.5            | Loss of biological integrity due to siltation H<br>Physical Substrate Habitat Alterations H                      | Pasture Grazing<br>Unrestricted Cattle Access                              | Stream is Category 5. (One or more uses impaired.)   |
| CEDAR CREEK         | 7.5            | Loss of biological integrity due to siltation H  | Pasture Grazing  | Stream is Category 5. (One or more uses impaired.)   |
| LONG CREEK          | 13.5           | Escherichia coli NA  | Pasture Grazing  | Category 4a. Impaired, but EPA approved a TMDL for known pollutants.   |

## Ecological Health Ratings for Cherokee Reservoir

**Dissolved oxygen:** **Poor** As in previous years, dissolved oxygen rated poor. Much of the water column had low dissolved oxygen levels during the summer months, and there were extended periods of time when virtually no oxygen was present in the water near the bottom.

**Chlorophyll:** **Good** Chlorophyll rated good as concentrations were slightly elevated but remained within the expected range. Ratings have fluctuated between good, fair and poor where annual variations in the amount of rainfall and runoff have been an important factor.

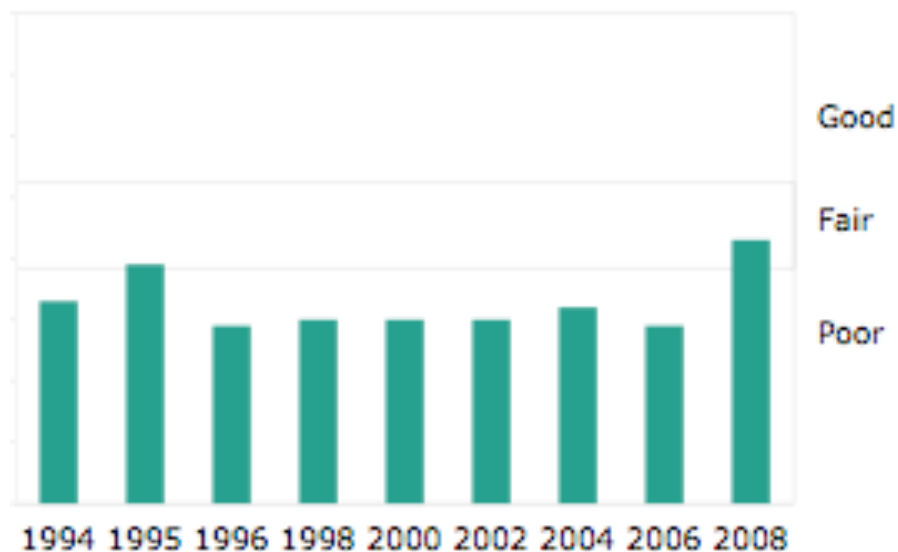
**Fish:** **Good** The fish community rated good, an improvement from the previous sampling period. Typically, the fish community has consistently rated fair or at the low end of the good range. A good variety of fish are collected, but many of the species are tolerant of degraded water quality.

**Bottom life:** **Fair** Ratings for bottom life were fair. The organisms collected, were primarily species able to tolerate poor conditions.

**Sediment:** **Good** Sediment quality rated good. Chlordane, a pesticide previously used to control termites and crop pests, has been found in some previous years.

*NOTE: Information presented above relates to samples taken from the reservoir FOREBAY only, as this is the part of the lake found in Jefferson County. As shown in the table below, Cherokee Reservoir as a whole rated "fair" in 2008 monitoring.*

**Cherokee Reservoir,  
Overall Ecological Health Ratings**



## Ecological Health Ratings for Douglas Reservoir

**Dissolved Oxygen:** **Poor** Consistent with findings from previous years, dissolved oxygen concentrations were very low during the summer, especially in the bottom half of the water column.

**Chlorophyll:** **Poor** Chlorophyll rated poor at the mid-reservoir monitoring location. Summer chlorophyll averages are generally higher at the mid-reservoir site, rating poor in most years.

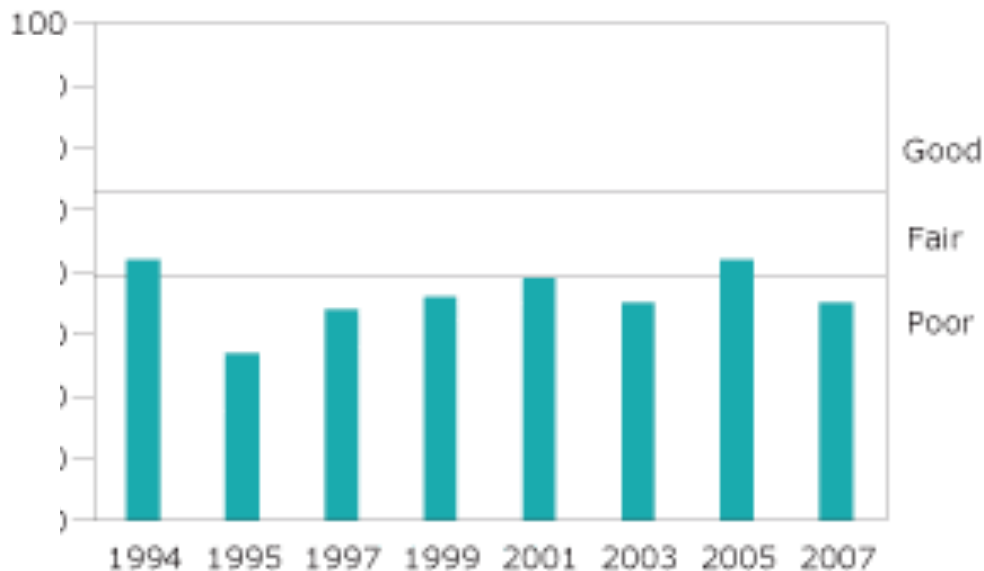
**Fish:** **Fair** The fish community rated fair. The fish community received its lowest score to date because the catch rate was relatively low and fewer fish species were collected than normal. Sampling results were affected by low water levels, a result of the extremely dry conditions.

**Bottom life:** **Fair** Bottom life rated at the low end of the fair range. As in previous years, TVA found relatively few animals in samples collected from the reservoir bottom, and the animals collected were primarily species capable of tolerating poor conditions.

**Sediment:** **Good** Sediment quality rated good. Low levels of chlordane, a pesticide previously used to control termites and crop pests, were detected in sediment samples in some previous years, resulting in a “Fair” rating.

*NOTE: Information presented above relates to samples taken from the MID-RESERVOIR sampling location only, as this is the part of the lake found in Jefferson County. As shown in the table below, Douglas Reservoir as a whole rated “poor” in 2007 monitoring.*

**Douglas Reservoir,  
Overall Ecological Health Ratings**



## Cherokee Lake Water Quality (E. Coli Counts) 2009 Report (compiled March 2010)

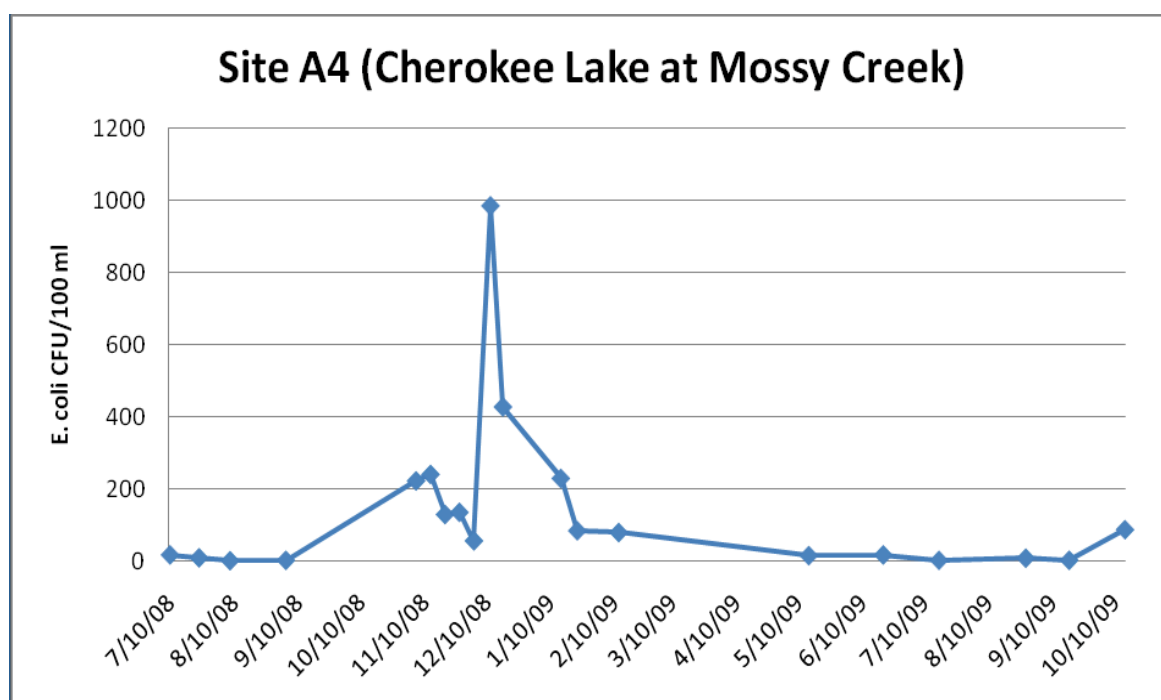
The Cherokee Lake Users' Association is a group of local residents who are concerned about the water quality of the lake and has partnered with the Carson-Newman College Biology Department to collect and evaluate water samples on a regular basis for fecal contamination (E. coli counts). E. coli is a bacterium found in fecal samples. Its presence in environmental waters suggests fecal contamination such as animal waste or sewage. Waste can enter surface waters via direct dumping into the lake or stream, via runoff from wooded areas, pastures, feedlots, and septic systems, and from sewage treatment plants. Fecal contamination in surface waters typically increases after a heavy rain in areas with wildlife or livestock due to runoff. Small amounts of fecal coliforms are always present in environmental waters. State standards for Tennessee (Water quality standards for recreational use classification) are as follows:

- E. coli not to exceed 126 cfu\*/100 ml (average of at least 5 sample collected within one month)
- E. coli in any individual sample shall not exceed 487 cfu/100 ml

\*cfu = colony forming units; an indication of the number of bacteria cells present in the sample.

Three different methods have been used to test the water for E. coli and total coliforms depending on availability of materials (methods: Coliblu, m-TEC and Idexx). The most recent samples (November, 2009) were tested with the Idexx method (the same method used by the Jefferson City Water Treatment Facility.)

As seen in the graph and on the data tables that follow, only one site (A-4, Cherokee Lake at Mossy Creek) had periods of consistently high E. coli counts in 2008. However, all samples taken in 2009 showed allowable levels for E. coli.



All results are shown in Table 1 (Sites A- C) and Table 2 (Sites D-F) below, and on the following page. E. coli counts are expressed as colony forming units (cfu) per 100 ml water.

| Table 1: Sites A-C |             |               |            |           |                  |          |             |          |               |         |                   |              |
|--------------------|-------------|---------------|------------|-----------|------------------|----------|-------------|----------|---------------|---------|-------------------|--------------|
| Date               | Test Method | A             |            |           |                  | B        |             |          |               | C       |                   |              |
|                    |             | 1             | 2          | 3         | 4                | 1        | 2           | 3        | 4             | 1       | 2                 | 3            |
|                    |             | Panther Creek | Cedar Hill | Black Oak | Mossy Creek      | Dam Cove | May Springs | Greenlee | Cardinal Cove | Gilmore | German Creek Dock | German Creek |
| 7/9/08             | Colibblue   |               |            |           |                  |          |             |          |               | 0       | 0                 | 0            |
| 7/10/08            | Colibblue   | 7             | 6          | 1         | 18               |          | 7           | 6        | 7             |         |                   |              |
| 7/24/08            | Colibblue   | 4             | 6          | 3         | 10               | 1        | 1           | 0        | 0             | 6       | 0                 | 4            |
| 8/8/08             | Colibblue   | 0             | 0          | 0         | 2                | 0        | 0           | 0        | 0             | 0       | 0                 | 0            |
| 9/4/08             | Colibblue   | 0             | 0          | 5         | 3                | 2        | 2           | 0        | 0             | 8       | 0                 | 0            |
| 9/9/08             | Colibblue   |               |            |           |                  |          |             |          |               |         |                   |              |
| 11/6/08            | Colibblue   | 216           | 1          | 2         | 223              | 3        | 0           | 0        | 0             |         | 0                 | 0            |
| 11/13/08           | Colibblue   | 5             | 0          | 16        | 241              |          |             |          |               |         |                   |              |
| 11/20/08           | Colibblue   | 162           |            |           | 130              |          |             |          |               |         |                   |              |
| 11/27/08           | Colibblue   |               |            |           | 136              |          |             |          |               |         |                   |              |
| 12/04/08           | Colibblue   |               |            |           | 57               |          |             |          |               |         |                   |              |
| 12/12/08           | Colibblue   | 2             | 16         | 16        | 985 <sup>1</sup> |          |             |          |               |         |                   |              |
| 12/18/08           | Colibblue   |               |            |           | 428              |          |             |          |               |         |                   |              |
| 01/15/09           | Colibblue   |               |            |           | 230              |          |             |          |               |         |                   |              |
| 01/15/09           | Colibblue   |               |            |           | 283              |          |             |          |               |         |                   |              |
| 01/23/09           | Colibblue   |               |            |           | 85               |          |             |          |               |         |                   |              |
| 02/12/09           | Colibblue   | 100           | 110        | 65        | 80               |          |             |          |               |         |                   |              |
| 5/15/09            | m-TEC       | 26            | 46         | 8         | 16               | 2        | 22          | 5        | 14            | 32      | 8                 | 242          |
| 6/20/09            | m-TEC       | 8             | 8          | 38        | 18               | 0        | 0           | 4        | 2             |         | 0                 | 0            |
| 7/17/09            | m-TEC       | 4             | 6          | 6         | 3                | 8        | 2           | 1        | 2             |         |                   |              |
| 8/28/09            | m-TEC       | 1             | 0          | 7         | 9                | 8        | 0           | 0        | 2             | 4       | 1                 | 0            |
| 9/18/09            | m-TEC       | 3             | 1          | 6         | 3                | 0        | 0           | 1        | 0             | 1       | 1                 | 0            |
| 10/15/09           | Colibblue   | 78            | 29         | 13        | 88               | 4        | 3           | 0        | 3             | 1       | 2                 | 4            |
| 11/4/09            | Idexx       | 2             | 0          | 2         | 3                | 0        | 0           | 3        | 0             | 0       | 0                 | 0            |

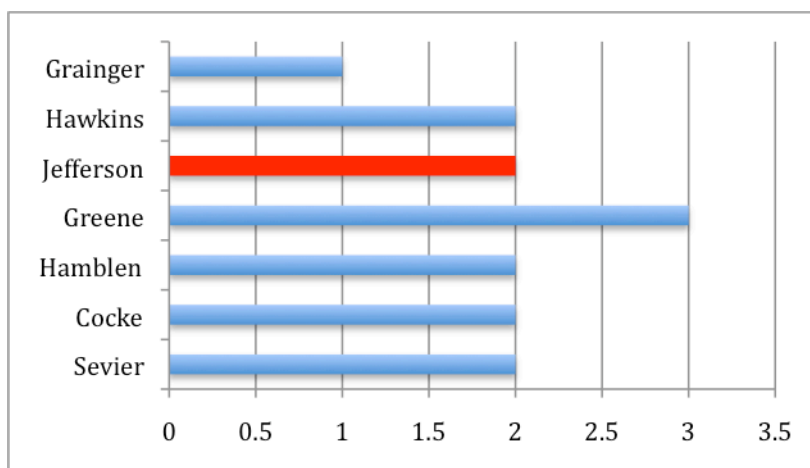
<sup>1</sup> A4 E. coli counts of 12/12 = 985/100ml (20 ml filtered resulted in 197 CFU)

| Table 2: Sites D-F |             |                |                |                |    |            |             |               |    |    |    |    |    |    |
|--------------------|-------------|----------------|----------------|----------------|----|------------|-------------|---------------|----|----|----|----|----|----|
| Date               | Test Method | D              |                |                |    | E          |             |               | F  |    |    |    |    |    |
|                    |             | 1              | 2              | 3              | 5  | 1          | 2           | 3             | 1  | 2  | 3  | 4  | 5  | 6  |
|                    |             | Turkey Creek 1 | Turkey Creek 2 | Hamblen County |    | Fall Creek | Poor Valley | Cherokee Dock | NA | NA | NA | NA | NA | NA |
| 7/9/08             | Colibblue   |                | 0              | 16             |    | 0          | 0           | 8             |    |    |    |    |    |    |
| 7/10/08            | Colibblue   | 1              |                |                |    |            |             |               |    |    |    |    |    |    |
| 7/24/08            | Colibblue   |                | 5              | 3              |    | 0          | 31          | 8             | 0  | 1  |    |    |    |    |
| 8/8/08             | Colibblue   | 1              | 0              | 5              |    | 1          |             |               | 0  | 16 |    |    |    |    |
| 9/4/08             | Colibblue   | 0              | 0              |                | 7  | 0          | 471         | 4             | 0  | 6  |    |    |    |    |
| 9/9/08             | Colibblue   | 2              |                |                |    | 1          | 10          | 2             |    |    |    |    |    |    |
| 11/6/08            | Colibblue   |                | 3              | 7              |    | 1          |             |               | 0  | 0  |    |    |    |    |
| 11/13/08           | Colibblue   | 0              |                |                |    |            |             |               |    |    |    |    |    |    |
| 11/20/08           | Colibblue   |                |                |                |    |            |             |               |    |    |    |    |    |    |
| 11/27/08           | Colibblue   |                |                |                |    |            |             |               |    |    |    |    |    |    |
| 12/04/08           | Colibblue   |                |                |                |    |            |             |               |    |    |    |    |    |    |
| 12/12/08           | Colibblue   |                | 4              | 0              |    | 10         | 2           | 6             |    |    |    |    |    |    |
| 12/18/08           | Colibblue   | 0              |                |                |    |            |             |               |    |    |    |    |    |    |
| 01/15/09           | Colibblue   |                |                |                |    |            |             |               |    |    |    |    |    |    |
| 0/15/09            | Colibblue   |                |                |                |    |            |             |               |    |    |    |    |    |    |
| 01/23/09           | Colibblue   |                |                |                |    |            |             |               |    |    |    |    |    |    |
| 02/12/09           | Colibblue   |                |                |                |    |            |             |               |    |    |    |    |    |    |
| 5/15/09            | m-TEC       | 84             | 32             | 96             |    |            |             | 166           | 84 | 24 |    |    |    |    |
| 6/20/09            | m-TEC       | 4              | 0              | 4              | 10 | 12         | 10          |               | 2  | 34 | 6  |    |    |    |
| 7/17/09            | m-TEC       | 9              | 0              | 12             |    | 5          |             |               |    |    |    |    |    |    |
| 8/28/09            | m-TEC       | 1              | 3              | 4              | 5  | 1          | 5           | 8             | 0  | 2  | 1  |    |    |    |
| 9/18/09            | m-TEC       |                | 200+           | 5              |    | 1          |             |               | 2  | 1  | 3  |    |    |    |
| 10/15/09           | Colibblue   |                | 3              | 0              |    | 1          |             |               |    | 11 |    |    |    |    |
| 11/4/09            | Idexx       |                | 4              | 4              |    | 1          |             |               | 0  | 0  | 0  | 2  | 2  | 4  |

| Table 3 - Cherokee Lake E. coli Sampling Test Sites |      |                 |             |
|---|------|-----------------|-------------|
| Location Description                                | Code | GSP coordinates |             |
| Panther Creek                                       | A1   | 36° 12' 29"     | 83° 25' 10" |
| Cedar Hill  | A2   | 36° 11' 47"     | 83° 25' 55" |
| Black Oak   | A3   | 36° 9' 14"      | 83° 29' 1"  |
| Mossy Creek   | A4   | 36° 7' 57"      | 83° 30' 23" |
|   |      |                 |             |
| Dam Cove  | B1   | 36° 9' 17"      | 83° 30' 47" |
| May Springs   | B2   | 36° 12' 48"     | 83° 27' 55" |
| Greenlee  | B3   | 36° 14' 6"      | 83° 25' 47" |
| Cardinal Cove                                       | B4   | 36° 15' 39"     | 83° 24' 48" |
|   |      |                 |             |
| Gilmore   | C1   | 36° 16' 14"     | 83° 23' 51" |
| German Creek Dock                                   | C2   | 36° 17' 92"     | 83° 19' 92" |
| German Creek  | C3   | 36° 18' 66"     | 83° 21' 93" |
|   |      |                 |             |
| Turkey Creek 1                                      | D1   | 36° 15' 83"     | 83° 17' 39" |
| Turkey Creek 2                                      | D2   | 36° 15' 28"     | 83° 17' 29" |
| Hamblen County                                      | D3   | 36° 15' 95"     | 83° 16' 33" |
|   |      |                 |             |
| Fall Creek  | E1   | 36° 17' 26"     | 83° 13' 51" |
| Poor Valley   | E2   | 36° 16' 59"     | 83° 14' 47" |
| Cherokee Dock                                       | E3   | 36° 16' 59"     | 83° 10' 10" |

Sites FI-6 are not shown above. They were added to the sampling schedule in 2009, and—at the time of this report preparation—GPS coordinates for those sites had not been received from the CLUA.

## Water Pollution Control Permit Violations



Two water pollution control permit violations were documented in Jefferson County during 2009, down from eight violations the previous year. This number is for both private and municipal entities.

*TDEC Enforcement Database, 2009*

# Jefferson County's Wildlife Resources

## Cherokee Reservoir

### Sportfish Survey Results

| Parameter                          | 2009  | 2007  | 2006 | 2004 |
|------------------------------------|-------|-------|------|------|
| Hours electrofished                | 6     | 6     | 6    | 6    |
| Total number of black bass         | 94    | 329   | 172  | 74   |
| Percent harvestable (over 10")     | 57.95 | 40.46 | 63.1 | 69.4 |
| Number of largemouth bass          | 88    | 304   | 160  | 72   |
| Number of smallmouth bass          | 1     | 2     | 1    | 0    |
| Number of spotted bass             | 5     | 23    | 11   | 2    |
| Number of crappie                  | 4     | 17    | 42   | 3    |
| Number of white crappie            | 0     | 7     | 17   | 1    |
| Number of black crappie            | 4     | 10    | 25   | 2    |
| Electrofishing catch rate (per hr) | 57.7  | 54.8  | 28.7 | 12.3 |
| Average weight (pounds)            | 1.3   | 1.6   | 2    | 1.2  |
| Largest black bass (pounds)        | 3.5   | 5.1   | 4.5  | 3.1  |
| Disease/parasites (percent)        | 9.6   | 7.9   | 26.2 | 10.8 |
| Number weighing > 5 pounds         | 0     | 1     | 0    | 0    |
| Number weighing > 4 pounds         | 0     | 3     | 2    | 0    |
| Number weighing > 3 pounds         | 3     |       | 10   | 1    |

## Douglas Reservoir

### Sportfish Survey Results

| Parameter                            | 2009 | 2008 | 2007 |
|--------------------------------------|------|------|------|
| Hours electrofished                  | 18   | 18   | 18   |
| Total number of black bass           | 1061 | 1061 | 722  |
| Percent harvestable (over 10 inches) | 63.8 | 54.3 | 45.1 |
| Number of largemouth bass            | 1037 | 1034 | 704  |
| Number of smallmouth bass            | 24   | 27   | 18   |
| Number of spotted bass               | 0    | 0    | 0    |
| Number of crappie                    | 54   | 109  | 98   |
| Number of white crappie              | 27   | 69   | 48   |
| Number of black crappie              | 27   | 40   | 50   |
| Electrofishing catch rate (per hour) | 58.9 | 57.4 | 40.1 |
| Average weight (pounds)              | 1.2  | 1.2  | 1.26 |
| Largest black bass (pounds)          | 5.9  | 6    | 4.4  |
| Disease/parasites (percent)          | 15.9 | 24.0 | 4.06 |
| Number weighing more than 5 pounds   | 3    | 6    | 0    |
| Number weighing more than 4 pounds   | 10   | 19   | 5    |
| Number weighing more than 3 pounds   | 30   | 42   | 17   |

### Sportfish Ratings

| Fish Species    | 2008 Score | 2008 Valleywide Average | 2007 Score | 2007 Valleywide Average |
|-----------------|------------|-------------------------|------------|-------------------------|
| Black Bass      | 35         | 37                      | 32         | 36                      |
| Black Crappie   | 31         | 31                      | 50         | 34                      |
| Channel Catfish | 32         | 34                      | NA         | NA                      |
| Largemouth Bass | 40         | 35                      | 30         | 33                      |
| Smallmouth Bass | 24         | 31                      | 24         | 30                      |
| Spotted Bass    | 28         | 33                      | 28         | 33                      |
| Striped Bass    | 44         | 35                      | 46         | 37                      |
| Walleye         | 28         | 38                      | NA         | NA                      |

**Sport Fishing Index** scores for different species are based both on population measures (the size and health of the individual fish, along with the number of fish present) and angler use and success information (the number of anglers looking for a particular type fish, and the number of that type they actually catch).

### Sportfish Ratings

| Fish Species    | 2008 Score | 2008 Valleywide Average | 2007 Score | 2007 Valleywide Average |
|-----------------|------------|-------------------------|------------|-------------------------|
| Black Basses    | 31         | 37                      | 31         | 36                      |
| Black Crappie   | 30         | 31                      | 32         | 34                      |
| Bluegill        | NA         | NA                      | 30         | 27                      |
| Channel Catfish | NA         | 34                      | 31         | 33                      |
| Crappie         | 30         | 31                      | 42         | 36                      |
| Largemouth Bass | 28         | 35                      | 33         | 33                      |
| Sauger          | NA         | NA                      | 24         | 24                      |
| Smallmouth Bass | 26         | 31                      | 24         | 30                      |
| Walleye         | 28         | 38                      | 32         | 34                      |
| White Bass      | 48         | 40                      | 44         | 38                      |
| White Crappie   | 28         | 33                      | 28         | 28                      |

## Threatened and Endangered Species in Jefferson County

| Type               | Scientific Name                 | Common Name            | Global Rank | St. Rank | Fed. Prot. | St. Prot. | Habitat  |
|--------------------|---------------------------------|------------------------|-------------|----------|------------|-----------|--|
| Bird               | <i>Haliaeetus leucocephalus</i> | Bald Eagle             | G5          | S3       | **         | D         | Areas close to large bodies of water. Roosts in sheltered sites in winter. <u>Communal roost sites common.</u>                                     |
| Fish               | <i>Cycleptus elongatus</i>      | Blue Sucker            | G3G4        | S2       | **         | T         | Swift waters over firm substrates in big rivers.   |
| Flowering Plant    | <i>Arabis patens</i>            | Spreading Rockcress    | G3          | S1       | **         | E         | Moist Rocky Woods  |
| Flowering Plant    | <i>Cimicifuga rubifolia</i>     | Appalachian Bugbane    | G3          | S3       | **         | T         | Rich Woods   |
| Flowering Plant    | <i>Panax quinquefolius</i>      | American Ginseng       | G3G4        | S3S4     | **         | S-CE      | Rich Woods   |
| Mammal             | <i>Myotis grisescens</i>        | Gray Bat               | G3          | S2       | LE         | E         | Cave obligate year-round; esp. forested areas; migratory.  |
| Mammal             | <i>Myotis sodalis</i>           | Indiana Bat            | G2          | S1       | LE         | E         | Hibernates in caves; spring/summer maternity roosts are normally under the <u>bark of standing trees.</u>  |
| Mollusc            | <i>Cumberlandia monodonta</i>   | Spectaclecase          | G3          | S2S3     | C          | **        | Medium to large rivers; in substrates from mud and sand to gravel, cobble, and boulders; Cumberland and Tennessee <u>river systems</u>             |
| Mollusc            | <i>Dromus dromas</i>            | Dromedary Pearlymussel | G1          | S1       | LE         | E         | Medium-large rivers with riffles and shoals w/ relatively firm rubble, gravel, and stable substrates; Tennessee & <u>Cumberland systems.</u>       |
| Mollusc            | <i>Fusconaia cor</i>            | Shiny Pigtoe           | G1          | S1       | LE         | E         | Shoals and riffles of small-medium sized rivers with mod-fast current over sand-cobble substrates; upper Tennessee River <u>watershed.</u>         |
| Mollusc            | <i>Io fluvialis</i>             | Spiny Riversnail       | G2          | S2       | **         | **        | Shallow waters of shoals that are rapid to moderate and well-oxygenated; Tennessee River & main tributaries; E <u>Tennessee.</u>                   |
| Mollusc            | <i>Lampsilis abrupta</i>        | Pink Mucket            | G2          | S2       | LE         | E         | Generally a large river species, preferring sand-gravel or rocky substrates with mod-strong currents; Tennessee & <u>Cumberland river systems.</u> |
| Mollusc            | <i>Plethobasus cicatricosus</i> | White Wartyback        | G1          | S1       | LE         | E         | Presumed to inhabit shoals and riffles in large rivers; Tennessee & Cumberland river systems. Very rare & poss <u>extirpated in TN.</u>            |
| Non-Vascular Plant | <i>Archidium alternifolium</i>  | **                     | G4G5        | S1       | **         | T         | Limestone Barrens  |

## ***Description of Federal and State Ranks & Status Codes***

**GLOBAL RANK** - The global or world-wide rank of a species which is a non-legal rank indicating the rarity and vulnerability of a species

**G1** Extremely rare and critically imperiled in the world with five or fewer occurrences, or very few remaining individuals, or because of some special condition where the species is particularly vulnerable to extinction

**G2** Very rare and imperiled within the world, six to twenty occurrences, or few remaining individuals, or because of some factor(s) making it vulnerable to extinction

**G3** Rare and uncommon in its range or found locally in a restricted range, generally from 21-100 occurrences

**G4** Widespread, abundant, and apparently secure globally, but with cause for long-term concern

**G5** Demonstrably widespread and secure globally

**STATE RANK** - The state rank of a species in Tennessee. Like the G\_rank, this is a non-legal rank indicating the rarity and vulnerability of a species at the state level.

**S1** Extremely rare and critically imperiled in the state with five or fewer occurrences, or very few remaining individuals, or because of some special condition where the species is particularly vulnerable to extinction

**S2** Very rare and imperiled within the state, six to twenty occurrences, or few remaining individuals, or because of some factor(s) making it vulnerable to extinction

**S3** Rare and uncommon in the state, from 21-100 occurrences

**S4** Widespread, abundant, and apparently secure within the state, but with cause for long-term concern

**FEDERAL STATUS** - The federal listing under the U.S. Endangered Species Act

**LE, Listed Endangered** Taxon is threatened by extinction throughout all or a significant portion of its range

**C, Candidate species** Taxon for which the USFWS has sufficient information to support proposals to list the species as threatened or endangered, and for which the Service anticipates a listing proposal

**STATE STATUS** -The legal listing in Tennessee

**E, Endangered** Any species or subspecies whose prospects of survival or recruitment within the state are in jeopardy or are likely to become so within the foreseeable future

**T, Threatened** Any species or subspecies that is likely to become an endangered species within the foreseeable future

**D, Deemed in Need of Management** Any species or subspecies of nongame wildlife which the executive director of the TWRA believes should be investigated in order to develop information relating to populations, distribution, habitat needs, limiting factors, and other biological and ecological data to determine management measures necessary for their continued ability to sustain themselves successfully. This category is analogous to "Special Concern."

**S-CE, Special Concern - Commercially Exploited** Special Concern Species means any species or subspecies of plant which is uncommon in Tennessee, or has unique or highly specific requirements or scientific value and therefore requires careful monitoring of its status. Commercially exploited, due to large numbers being taken from the wild and propagation or cultivation insufficient to meet market demand. These plants are of long-term conservation concern.

## Henderson Island Species List

*NOTE: The following species-specific information was gathered as a result of an observational study of wildlife on Henderson Island, which is located in Jefferson County on Douglas Lake south of Dandridge. Thanks to the work of a graduate student at East Tennessee State University, data was gathered that focused on the movement of various animals on the 300-acre island. The numbers presented below are not to be interpreted as evidence of population trends, since they represent such a short period of observation. Rather they are more of a “snapshot” — a quick picture of some of the mammals, reptiles, amphibians, and birds that were using the island habitat during the study period. Of particular interest are the numbers related to the Tiger Salamander, a secretive and uncommon species (Henderson Island is home to the only known population in East Tennessee) with a lifespan of 50 years. The largest terrestrial salamander in the state, they range in size from nine to 12 inches in length and weigh about a pound. Conditions are good for the Tiger salamander and other species due in large part to the fact that Henderson Island is public land and relatively unused by humans for much of the year. The island’s habitat includes meadows, woodlands, mudflats, and ponds—providing a sort of “oasis” for wildlife.*

|                             | 2009 | 2010  |
|-----------------------------|------|-------|
| Spotted salamander          |      |       |
| Adult                       | 78   | 500   |
| Larval                      | 2    |       |
| Eastern Tiger salamanders   |      |       |
| Adult                       | 22   | 63    |
| Larval                      | 68   |       |
| Upland chorus frog          | 149  | > 376 |
| Spring peeper               | 25   | 31    |
| Pickeral frog               | 22   | > 227 |
| Painted turtle              | 5    | 3     |
| Red-ear slider              | 2    | 1     |
| Northern short-tailed shrew | 4    | 4     |
| Hispid cotton rat           | 4    | 14    |
| Least shrew                 | 4    | 8     |
| Woodland vole               | 2    | 7     |
| American Deer Mouse         | 4    | 2     |
| White-footed deer mouse     | 7    | 8     |

### **Birds**

|                     |                        |                        |
|---------------------|------------------------|------------------------|
| Hooded merganser    | Northern cardinal      | Carolina chickadee     |
| Mallard             | Song sparrow           | Sharp shinned hawk     |
| Carolina wren       | Yellow-rumped warbler  | Dark eyed junco        |
| Great blue heron    | Northern mockingbird   | Ring necked duck       |
| Eastern bluebird    | Eastern towhee         | Red bellied woodpecker |
| American crow       | Northern flicker       | Canada goose           |
| Eastern wild turkey | White throated sparrow | Hairy woodpecker       |
| Black vulture       | Eastern phoebe         | Pileated woodpecker    |
| Turkey vulture      | Blue jay               | Field sparrow          |
| Mourning dove       | Red tailed hawk        | American coot          |