3.1.3 Soils
The Big Walnut Watershed consists of nearly level to gently sloping productive till plain. Most of the soils have a high water holding capacity. Figures G1-G5 (Appendix A) illustrates the location of hydric and upland soils within each 11-HUC watershed. Erosion can be of concern in areas with gentle slopes. The nearly level soils are usually wet in the spring holding free water within one foot of the surface.

The majority of the soils in the watershed are silt loams and silty clay loams. The major soil units include: Xenia silt loam (XeB2); Reelsville silt loam (ReA); Crosby silt loam (CrA or CudA); Treaty silty clay loam (ThrA); and Brookston silty clay loam (Bs).

The silt loams in this area are of the till plains landform with parent material of loess over loamy till. Their drainage ranges from somewhat poorly drained to moderately well drained with a water table of 6 inches to 24 inches. Silty clay loams are either of the till plains or glacial drainage channels landforms. The parent material is loess over loamy till. The drainage class of silty clay loams is poorly drained with a water table of 0 to 12 inches. Many of the silty clay loam soils are classified as hydric soils.

Table 2 summarizes the acres of hydric soil, percent hydric soil, acres of wetland, percent wetland, acres of floodplain, and percent floodplain for each 14-HUC watershed and for the entire Big Walnut Creek Watershed.

In addition to hydric soils, highly erodible land (HEL) was also researched. This information came from the NRCS, but is quite dated. The most current and official data is from 1987. According to this information, the majority of the soil types present within the watershed are considered highly erodible. Figures H1-H5 (Appendix A) illustrates the majority of HEL within the watershed on an 11-digit HUC.

The soils of the Big Walnut Creek Watershed were also researched for suitability for septic systems. The majority of the soils within the watershed have a very limited to somewhat limited rating on septic tank absorption fields and sewage lagoons. It is a common concern among the public and county agencies that many of the septic systems in the Big Walnut Creek Watershed are failing and contributing to water quality problems. However, if properly sited and maintained septic systems can be safe and effective for treating wastewater. Recommendations related to septic system maintenance and education will be addressed in future sections of this Plan.

3.1.4 Climate
Indiana is known regionally to have a climate with well-defined seasons. The location of the state within the continental US is the major factor in this seasonal cycle fluctuation. The Gulf of Mexico brings warm, moist air, while jet streams from Canada bring cold, polar air. Weather in Indiana changes every few days as the jet stream fluctuates bringing either cold polar air or warm tropical air.

Indiana’s local climate varies statewide as it is influenced by differences in latitude, terrain, soils, and lakes. The Big Walnut Watershed’s mean temperature between 1971 and 2000 ranged
<table>
<thead>
<tr>
<th>Subwatershed</th>
<th>Watershed Acreage</th>
<th>Acres of Hydric Soil</th>
<th>Percent Hydric Soil</th>
<th>Acres of NWI Wetlands</th>
<th>Percent NWI Wetlands</th>
<th>Acres of Floodplain</th>
<th>Percent Floodplain</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Big Walnut Creek - Barnard</td>
<td>10027</td>
<td>1830.47</td>
<td>18.26%</td>
<td>16.02</td>
<td>0.16%</td>
<td>1349.42</td>
<td>13.46%</td>
</tr>
<tr>
<td>B Big Walnut Creek - Dry Branch</td>
<td>8145</td>
<td>138.65</td>
<td>1.70%</td>
<td>16.47</td>
<td>0.20%</td>
<td>1577.54</td>
<td>19.37%</td>
</tr>
<tr>
<td>C Big Walnut Creek - Ernie Pyle Memorial Highway</td>
<td>8417</td>
<td>368.70</td>
<td>4.38%</td>
<td>21.86</td>
<td>0.26%</td>
<td>1874.25</td>
<td>22.27%</td>
</tr>
<tr>
<td>D Big Walnut Creek - Greencastle</td>
<td>14170</td>
<td>112.60</td>
<td>0.79%</td>
<td>28.64</td>
<td>0.20%</td>
<td>3599.22</td>
<td>25.40%</td>
</tr>
<tr>
<td>E Big Walnut Creek - Johnson Branch</td>
<td>9462</td>
<td>50.75</td>
<td>0.54%</td>
<td>20.08</td>
<td>0.21%</td>
<td>3070.40</td>
<td>32.45%</td>
</tr>
<tr>
<td>F Big Walnut Creek - Plum Creek/Bledsoe Branch</td>
<td>12122</td>
<td>393.92</td>
<td>3.25%</td>
<td>14.19</td>
<td>0.12%</td>
<td>2210.77</td>
<td>18.24%</td>
</tr>
<tr>
<td>G Big Walnut Creek - Snake Creek/Maiden Run</td>
<td>15537</td>
<td>185.30</td>
<td>1.19%</td>
<td>25.31</td>
<td>0.16%</td>
<td>4731.32</td>
<td>30.45%</td>
</tr>
<tr>
<td>H Clear Creek Headwaters (Putnam)</td>
<td>11125</td>
<td>1166.12</td>
<td>10.48%</td>
<td>41.48</td>
<td>0.37%</td>
<td>3043.60</td>
<td>27.36%</td>
</tr>
<tr>
<td>I Clear Creek - Miller Creek</td>
<td>8778</td>
<td>806.39</td>
<td>9.19%</td>
<td>11.73</td>
<td>0.13%</td>
<td>929.37</td>
<td>10.59%</td>
</tr>
<tr>
<td>J Deer Creek Headwaters (Putnam)</td>
<td>10573</td>
<td>710.52</td>
<td>6.72%</td>
<td>8.26</td>
<td>0.08%</td>
<td>450.90</td>
<td>4.26%</td>
</tr>
<tr>
<td>K Deer Creek - Leatherwood Creek</td>
<td>5852</td>
<td>21.43</td>
<td>0.37%</td>
<td>6.72</td>
<td>0.11%</td>
<td>1464.85</td>
<td>25.03%</td>
</tr>
<tr>
<td>L Deer Creek - Little Deer Creek</td>
<td>8798</td>
<td>372.65</td>
<td>4.24%</td>
<td>5.41</td>
<td>0.06%</td>
<td>1453.22</td>
<td>16.52%</td>
</tr>
<tr>
<td>M Deer Creek - Mosquito Creek</td>
<td>8094</td>
<td>17.56</td>
<td>0.22%</td>
<td>11.76</td>
<td>0.15%</td>
<td>2188.67</td>
<td>27.04%</td>
</tr>
<tr>
<td>N Deer Creek - Owl Branch</td>
<td>9727</td>
<td>93.07</td>
<td>0.96%</td>
<td>4.93</td>
<td>0.05%</td>
<td>2640.76</td>
<td>27.15%</td>
</tr>
<tr>
<td>O Deweese Creek</td>
<td>7006</td>
<td>109.63</td>
<td>1.56%</td>
<td>12.20</td>
<td>0.17%</td>
<td>1956.26</td>
<td>27.92%</td>
</tr>
<tr>
<td>P East Fork Big Walnut Creek - Lower</td>
<td>8909</td>
<td>2213.82</td>
<td>24.85%</td>
<td>14.36</td>
<td>0.16%</td>
<td>1866.64</td>
<td>20.95%</td>
</tr>
<tr>
<td>Q East Fork Big Walnut Creek - Ross Ditch</td>
<td>8975</td>
<td>6594.90</td>
<td>73.48%</td>
<td>4.84</td>
<td>0.05%</td>
<td>0.00</td>
<td>0.00%</td>
</tr>
<tr>
<td>R Hunt Creek</td>
<td>6880</td>
<td>1780.79</td>
<td>25.88%</td>
<td>6.21</td>
<td>0.09%</td>
<td>564.39</td>
<td>8.20%</td>
</tr>
<tr>
<td>S Jones Creek</td>
<td>8704</td>
<td>323.68</td>
<td>3.72%</td>
<td>13.94</td>
<td>0.16%</td>
<td>1740.03</td>
<td>19.99%</td>
</tr>
<tr>
<td>T Limestone Creek</td>
<td>8366</td>
<td>35.52</td>
<td>0.42%</td>
<td>4.98</td>
<td>0.06%</td>
<td>2831.42</td>
<td>33.84%</td>
</tr>
<tr>
<td>U Little Walnut Creek - Headwaters</td>
<td>7780</td>
<td>476.40</td>
<td>6.12%</td>
<td>9.34</td>
<td>0.12%</td>
<td>1888.78</td>
<td>24.28%</td>
</tr>
<tr>
<td>V Little Walnut Creek - Leatherman Creek</td>
<td>7303</td>
<td>134.30</td>
<td>1.84%</td>
<td>9.85</td>
<td>0.13%</td>
<td>2026.52</td>
<td>27.75%</td>
</tr>
<tr>
<td>W Little Walnut Creek - Long Branch</td>
<td>6991</td>
<td>183.47</td>
<td>2.62%</td>
<td>2.76</td>
<td>0.04%</td>
<td>1159.35</td>
<td>16.58%</td>
</tr>
<tr>
<td>X Main Edlin Ditch - Grassy Branch</td>
<td>5622</td>
<td>5441.71</td>
<td>96.79%</td>
<td>3.27</td>
<td>0.06%</td>
<td>2349.50</td>
<td>41.79%</td>
</tr>
<tr>
<td>Y Main Edlin Ditch - Smith Ditch</td>
<td>9377</td>
<td>9282.08</td>
<td>98.99%</td>
<td>2.79</td>
<td>0.03%</td>
<td>1586.98</td>
<td>16.92%</td>
</tr>
<tr>
<td>Subwatershed</td>
<td>Watershed Acreage</td>
<td>Acres of Hydric Soil</td>
<td>Percent Hydric Soil</td>
<td>Acres of NWI Wetlands</td>
<td>Percent NWI Wetlands</td>
<td>Acres of Floodplain</td>
<td>Percent Floodplain</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>-------------------</td>
<td>----------------------</td>
<td>---------------------</td>
<td>-----------------------</td>
<td>----------------------</td>
<td>---------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Z  Middle Fork Big Walnut Creek</td>
<td>8681</td>
<td>2831.21</td>
<td>32.61%</td>
<td>9.53</td>
<td>0.11%</td>
<td>1634.87</td>
<td>18.83%</td>
</tr>
<tr>
<td>AA Owl Creek</td>
<td>10343</td>
<td>315.98</td>
<td>3.06%</td>
<td>39.09</td>
<td>0.38%</td>
<td>1610.67</td>
<td>15.57%</td>
</tr>
<tr>
<td>BB Ramp Run - East Fork Outlet</td>
<td>8219</td>
<td>1748.68</td>
<td>21.28%</td>
<td>7.41</td>
<td>0.09%</td>
<td>977.04</td>
<td>11.89%</td>
</tr>
<tr>
<td>CC West Fork Big Walnut Creek Headwaters</td>
<td>7065</td>
<td>6958.16</td>
<td>98.49%</td>
<td>2.87</td>
<td>0.04%</td>
<td>1120.43</td>
<td>15.86%</td>
</tr>
<tr>
<td>DD West Fork Big Walnut Creek - Lower</td>
<td>10107</td>
<td>3559.23</td>
<td>35.22%</td>
<td>12.90</td>
<td>0.13%</td>
<td>2966.18</td>
<td>29.35%</td>
</tr>
<tr>
<td>Totals</td>
<td>271155</td>
<td>48257.69</td>
<td>17.80%</td>
<td>389.20</td>
<td>0.14%</td>
<td>56863.35</td>
<td>20.97%</td>
</tr>
</tbody>
</table>
from a low of 17.7°F in January to a high of 86.6°F in July, with the average low at 25.9°F and the average high at 75.5°F. Precipitation in the area from 1971 to 2000 ranges from a minimum of 2.40 inches to a maximum of 5.41 inches during any one month, with an annual average of 44.20 inches.

The frost free growing season in Indiana varies from 150 days in northeastern Indiana to over 200 days in southwestern Indiana. From 1971 to 2000, the Greencastle/ Putnam County area averages 184 days at a base temperature of 32°F. The last spring frost usually occurs on April 21 and the first fall frost usually occurs on October 20. Appendix B includes available historical growing season, precipitation, and temperature data.

3.1.5 Natural History
The Big Walnut Watershed lies within three ecoregions as designated by the Environmental Protection Agency (EPA) (Figure I). The regions are the Eastern Corn Belt Plains (55), the Interior Plateau (71); and the Interior River Lowland (72).

EASTERN CORN BELT PLAINS
The Eastern Corn Belt Plains is comprised of rolling till plains with local end moraines. Soils are rich, loamy, and well drained. Extensive glacial deposits of the Wisconsinan age are present. Native vegetation was mostly beech forests with elm-ash swamp forests present in wetter areas. Corn, soybean, and livestock production predominate as today’s land use.

INTERIOR PLATEAU
The Interior Plateau is characterized by landforms of open hills, irregular plains, and tablelands composed of limestone, chert, sandstone, siltstone, and shale. Native vegetation was primarily oak-hickory forests with some bluestem prairie areas. Land use today consists of mostly forest with some cropland.

INTERIOR RIVER VALLEYS AND HILLS
The Interior River Lowland is characterized by forested valley slopes, wide and flat bottomed valleys, and glacial till plains. Native vegetation consisted of oak-hickory forests and swamp forests were common in the lowlands. Land use today is a mix of cropland, forests, and surface coal mining.

3.1.6 Endangered Species and Significant Natural Areas
The Indiana Department of Natural Resources (IDNR) Division of Nature Preserves maintains the Indiana Natural Heritage Data Center database. This database keeps track of Indiana’s endangered, threatened, or rare (ETR) species and high quality natural communities. Development of the database allowed for documentation of significant species and areas and management priorities for areas where these special species or habitats are present.

ETR Species
A number ETR species and natural areas are present within the Big Walnut Watershed. Since the Big Walnut Watershed is so large, the number of ETR species is numerous. Lists of the ETR species by county have been included as Appendix C. State and federal classification guidelines are listed below.
Figure I - Ecoregions
Big Walnut Creek Watershed
Boone, Clay, Hendricks, Parke, & Putnam Counties, Indiana
STATE
Endangered: Any species whose chances of survival within the state are in jeopardy and are in danger of disappearing from the state. Species listed as endangered by the federal government and occur in Indiana are included on this list.

Rare: A species is rare if it is common nowhere. This generally means that the species has very specific habitat requirements and that the habitat itself is rare. A species can also be rare if populations can survive in niches outside the area that is considered to be common.

Special Concern: Any species with known or suspected concern of limited abundance or distribution in Indiana.

FEDERAL
Endangered: Any species in danger of becoming extinct throughout all or part of its range.

Threatened: Any species likely to become endangered in the near future throughout all or part of its range.

All counties within the Big Walnut Watershed are listed within the range of the federally endangered Indiana bat (*Myostis sodalis*). The bald eagle (*Haliaeetus leucocephalus*) was recently delisted.

Significant Natural Areas
Several significant natural areas are present within the Big Walnut Watershed (Figures J1-J5, Appendix A). These areas are maintained, preserved, and protected by a number of different organizations including IDNR, The Nature Conservancy (TNC), and the Central Indiana Land Trust Incorporated (CILTI).

Table 3 identifies natural areas located within the Big Walnut Watershed, the county of location, and the organization that maintains and/or manages them.

**Table 3: Natural Areas**

<table>
<thead>
<tr>
<th>Natural Area</th>
<th>Location</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Walnut Nature Preserve</td>
<td>Putnam County</td>
<td>TNC, IDNR</td>
</tr>
<tr>
<td>Fern Cliff Nature Preserve</td>
<td>Putnam County</td>
<td>TNC</td>
</tr>
<tr>
<td>Hall Woods Nature Preserve</td>
<td>Putnam County</td>
<td>IDNR</td>
</tr>
<tr>
<td>Hemlock Ridge Nature Preserve</td>
<td>Putnam County</td>
<td>CILTI</td>
</tr>
<tr>
<td>McCloud Nature Park</td>
<td>Hendricks County</td>
<td>Hendricks County Parks</td>
</tr>
</tbody>
</table>

Big Walnut Nature Preserve consists of approximately 2700 acres along Big Walnut Creek in northeastern Putnam County. It was designated a National Natural Landmark in 1985 and is known for its rolling hills and steep ravines.
Fern Cliff Nature Preserve is a 157 acre preserve in western Putnam County. The preserve was dedicated as a National Natural Landmark in 1980. It's a popular sanctuary in Indiana known for its steep, forested cliff and ravines. The ferns found in Fern Cliff Nature Preserve provide an abundance of unique vegetation.

Hall Woods Nature Preserve is another preserve located along Big Walnut Creek just east of Bainbridge. It is approximately 90 acres and has a high frequency of large white oak trees present. Other species present include sassafras, buckeye, maple, dogwood, beech, tulip trees, and many others.

Hemlock Ridge Nature Preserve is approximately 40 acres in the Big Walnut Creek Corridor. It is named for its stands of Canadian or Eastern Hemlock (*Tsuga canadensis*) present along the bedrock bluffs. The preserve also has two notable ravines which lead to a breath-taking view of Big Walnut Creek. Hemlock Ridge is also home to two State Rare plant species: Longstalk Sedge (*Carex pedunculata*) and Wolf Bluegrass (*Poa wolfii*).

McCloud Nature Park is a 232 acre park located in northwestern Hendricks County. The park is open to the public and offers numerous activities and programs throughout the year. It also provides access to Big Walnut Creek for those wishing to take a canoe or kayak trip.

The IDNR Division of Nature Preserves has drafted a corridor habitat protection plan for the Big Walnut Creek Corridor to continue the protection of key lands such as the ones mentioned above and others nearby that are currently publicly managed lands. Figure K represents lands that are currently being managed and those that are priorities to be protected.

### 3.2 Built Environment
#### 3.2.1 Cities and Towns
Several towns and one city are located in the Big Walnut Watershed. The City of Greencastle, located at the intersection of US 231 and IN 240, is the largest population center in the watershed and is the county seat of Putnam County. Greencastle was founded in 1821 by Ephraim Dukes and is believed to have been named after Greencastle, Pennsylvania. Greencastle is also home to DePauw University.

Other notable towns located in the watershed include: Jamestown, Lizton, North Salem, and Bainbridge. Coatesville and Cloverdale are right on the boundary of the watershed, but the majority of the towns do not lie within the watershed. Many other unincorporated towns are also located within the watershed. These are shown on Figure L and include: Milledgeville, New Brunswick, Barnard, New Maysville, New Winchester, Groveland, Clinton Falls, Brick Chapel, Cary, Fillmore, Fox Ridge, Limedale, Mount Meridian, Westland, Putnamville, Cradick Corner, Jenkinsville, Pleasant Gardens, Reelsville, Brunerstown, Keytsville, and Manhattan.

#### 3.2.2 Population
Increases in population lead to decreases in the availability of land and resources for agricultural and natural resource uses. The Big Walnut Watershed is located in a predominately rural area. The watershed is mostly located in Putnam County, which ranks 43rd in population out of the 92 Indiana counties. Greencastle, Bainbridge, and Fillmore combine for a total population based
Figure K - IDNR Habitat Protection Priority Sites
Big Walnut Creek Watershed
Boone, Clay, Hendricks, Parke, & Putnam Counties, Indiana
Figure L - Towns

Big Walnut Creek Watershed
Boone, Clay, Hendricks, Parke, & Putnam Counties, Indiana
on July 2005 estimates of 11,415 persons. The population for these three towns according to the April 2000 Census was 11,168 persons. The area showed a population change of 3.29 percent from April 2000 to July 2005.

Some of the other towns that contribute to the population of the watershed include Jamestown with 957 persons, Lizton with 358 persons, and North Salem with 636 persons for a total of 1951 persons. The April 2000 Census showed the combined population of these three towns to be 1849 persons with a change of 3.95 percent from April 2000 to July 2005. As shown by Census data, no one area of the watershed is developing or growing faster than any other. Population growth rates are steady and comparable across the watershed.

However regardless of the rate of population increase, the given population number and/or density of a given area often creates carries additional regulator complexity in regard to land use and utility planning. Due to the population densities that define Greencastle and DePauw University, both communities are considered Municipal Separate Storm Sewer entities (MS4s) and as such, have advanced stormwater management requirements. Similarly, Greencastle is also governed by more municipal ordinances than other population centers in the watershed.

3.2.3 Municipal Separate Storm Sewer Systems (MS4s)

Under NPDES Phase II stormwater regulations, several communities, universities, or other entities with concentrated populations were required to begin managing stormwater and reducing urban pollutant loads. These entities are referred to as Municipal Separate Storm Sewer Systems, or more commonly called MS4s. The name relates to the concept of understanding and managing stormwater influences from storm sewers that are not part of combine storm sewer systems. This sort of storm sewer infrastructure and associated outfalls to local streams is widespread geographically and often quite diverse in engineering design. Official MS4 entities are required to address six Minimum Control Measures (MCMs) in their effort to improve water quality:

1. Public Education Outreach
2. Public Involvement
3. Illicit Discharge Detection & Elimination
4. Construction Site Stormwater Runoff Control
5. Post-Construction Site Stormwater Runoff Control
6. Pollution Prevention & Good Housekeeping

There are two localized MS4 entities in the Big Walnut watershed, Greencastle and DePauw University. Boone and Hendricks Counties have other MS4 entities within their respective counties, but these areas are not within the Big Walnut Creek Watershed. Greencastle and DePauw are combined entities for the purposes of MS4 permitting and therefore work together to address the required Minimum Control Measures outlined in the Phase II regulation. This MS4’s boundary is shown in Figures M1-M2. Known stormwater outfalls within the Greencastle/DePauw MS4 are also shown in this figure.
Figure M2- Greencastle/DePauw University MS4 Area & Outfalls

Big Walnut Watershed
Boone, Clay, Hendricks, Parke, & Putnam Counties, Indiana
BOONE COUNTY
The Boone County Surveyor has taken on the responsibility of managing the Phase II Stormwater Program within the unincorporated portion of the County. Primary Contact information is:

Kenny Hedge
County Surveyor
116 West Washington Street
Lebanon, IN  46052
765-483-4444
khedge@co.boone.in.us

HENDRICKS COUNTY
There are six official MS4 entities in the Hendricks County. These include Avon, Brownsburg, Danville, Pittsboro, Plainfield, and the remaining unincorporated areas in the county. The Hendricks County Surveyor’s Office has implemented a program that includes many of the State mandated MS4 requirements as an official MS4. Currently, the program includes the enforcement of a storm water and sediment control ordinance, mapping of stormwater inlets, and educational signage at stormwater inlets. All inlets, outlets, and drains are being built into the county GIS.

Primary Contact for the unincorporated areas of Hendricks County is:
Clean Water Department
355 S. Washington St., #214
Danville, IN 46122
phone 317-718-6068
fax 317-718-6105

Primary contact for MSC 1 and 2 is:
Brooke Moore, Education Coordinator for Hendricks County
Hendricks County Partnership for Water Quality
195 Meadow Drive, Suite 1
Danville, IN 46122
317-718-6130
bmoore@co.hendricks.in.us

PUTNAM COUNTY
The Greencastle Planning Office has implemented the program that includes many of the State mandated MS4 requirements as an official MS4 for the city of Greencastle and DePauw University. Currently, the program includes the enforcement of a storm water and sediment control ordinance, mapping of stormwater inlets, and educational signage at stormwater inlets.

Primary contact for the MS4 program is:
3.2.4 Recreational Areas
Recreational areas can be found throughout the Big Walnut Watershed (Figures J1-J5, Appendix A). These include such areas as city or county parks, golf courses, or water/motor sport activities. Greencastle and Putnam County are home to the majority of these features within the watershed. The county is home to two golf courses, two motor sport racetracks, a minimum of four recreational parks, a trail system, and a number of lakes. Jamestown, located in Boone County is also home to Tomahawk Hills Golf Course. Finally, McCloud Nature Park is located in North Salem, in Hendricks County.

3.2.5 Historic Structures
There are 15 structures located in the Big Walnut Watershed that are listed on the National Register of Historic Places and/or the State Register of Historic Places. One is located in Boone County and 14 in Putnam County. Table 4 indicates the historic feature, its location, historic significance, and period of significance. Historic features are an important part to the fabric of many rural counties. Their presence may limit or dictate surrounding land use and has the potential to impact the type of projects that may be undertaken in certain areas due to their status as protected resources.

4.0 EXISTING ENVIRONMENTAL CONDITIONS
4.1 State – 303d List
A search of the Indiana Department of Environmental Management (IDEM) Section 303(d) List of Impaired Waters for 2006 revealed that 29 segments of stream within the Big Walnut Watershed are listed (Figure N, see Appendix D for complete list by segment). Of the 29 listed, all but two are listed for E. coli. These two are listed for impaired biotic communities; one is listed as an impaired biotic community as well as E. coli. Seven streams are listed for fish consumption advisory (FCA) for Mercury.

Recent approval of the 2008 Section 303(d) List of Impaired Waters also lists 29 segments of stream within the Big Walnut Watershed. Of the 29 listed, all but two are listed for E. coli. These two are listed for impaired biotic communities; one is listed as an impaired biotic community as well as E. coli. Two streams are listed for fish consumption advisory (FCA) for Mercury.

4.2 Research Conducted by Dr. James Gammon
Dr. James Gammon, professor emeritus of Biological Sciences at DePauw University, has conducted much research on Big Walnut Creek. His work, focused primarily on fish