SECTION 1

1. PROJECT AREA CHARACTERISTICS

Buffalo Creek is the largest tributary on the west side of the Allegheny River between Franklin (French Creek) and the Ohio. The watershed drains 171 square miles of eastern Butler, western Armstrong, and northern Allegheny Counties in western Pennsylvania. From its headwaters in Fairview Township, Butler County the stream flows 34.4 miles to the Allegheny River at Freeport, Armstrong County (Figure ES-1).

Since the earliest period of English settlement, the "Buffalo Country" has been recognized as a unique area. As described by Francis Harbison in 1941, *"One can stand on the crest of a knoll in a little country burial ground within its boundaries and view the land around it. The western sun lights up the timbered dome of Bell's Knob arched in green on the eastern horizon. The fertile farms around it were a prairie in the midst of a timbered wilderness on which lush grasses grew and lured the buffalo and deer from forest retreats, where, when men first visited it, they found the buffalo feeding upon it and called it the Buffalo Lands. It is bordered by precipitous hills clothed in the dark green of pines and hemlock mingled with the lighter tones of the annuals. Nearer, and deeper within its narrow valley, the Little Buffalo Creek flows southward into the Big Buffalo to the Allegheny River, the Ohio of old, "Beautiful River" of the Indians.*"

In 1889 W.E. Clyde Todd, later to become an internationally renowned ornithologist, made his first visit to the Buffalo Creek valley. What he found in the rugged topography was a relict of the primeval Pennsylvania forests. Hidden in the valleys of Armstrong and Butler Counties were stands of massive northern conifers and hardwoods, dominated by the Eastern Hemlock and White Pine. These forests contained avian communities unlike any others he had encountered. The assemblage of species suggested the high Appalachian summits or the forests of New England, not the Ohio valley. Moreover, the region had the geographic good fortune to be within the area where a number of other bird species reached the limits of their breeding range, either northward or southward. The result was an astounding diversity of species in the relatively small confines of what he defined as the "Buffalo Creek Region".

SIDEBAR:
The Buffalo Creek Region, 1898.

The valley of Buffalo Creek is a mere gorge, its bottom usually quite narrow, and the neighboring slopes steep and rugged, sometimes rising as precipitous sandstone cliffs, rendering the scenery along the creek ***among the most wild and picturesque in western Pennsylvania****. The lower portions of the courses of its tributary streams are scarcely less striking, scarcely ever a hundred feet wide, and hemmed in by steep slopes whose slopes pass abruptly into the level upland country.*

Much of the region has been cleared and brought under cultivation, but considerable areas of forest land still remain, even on the uplands and higher summits. It is along the streams however, that the woodland mostly occurs. The side-hills of Buffalo Creek are heavily timbered, and the valleys or ravines of its tributary brooks support a forest-growth that for wildness and luxuriance is unexcelled in this part of the state.

W.E. Clyde Todd 1898 (1969)

Much has changed. The uplands are much less intensively farmed now. Second growth woodlands, scattered residences, and subdivisions occupy what was once an agricultural landscape. The virgin stands of hemlock and pines are gone. But what is remarkable is how much has remained. Because of its rugged topography, the land still bears a heavy mantle of trees. When seen on a large-scale map, it is one of the closest green islands to Pittsburgh and its sprawling suburbs. The valleys and ravines are still filled by hemlocks and pines.

1.1 TOPOGRAPHY AND CLIMATE

The Buffalo Creek region lies within the Appalachian Plateau topographic region, defined by a dissected upland formed on warped sedimentary rocks. The watershed is typified by rolling uplands dissected by deeply entrenched valleys (Figure 1-1). The largest and deepest of these valleys, created by the lower reaches of Buffalo and Little Buffalo Creeks, form gorges with precipitous slopes and sandstone cliffs. The watershed has a total relief of nearly 800 feet, with elevations ranging from approximately 1,525 feet in Sugarcreek Township, Armstrong County to 745 feet at Freeport.

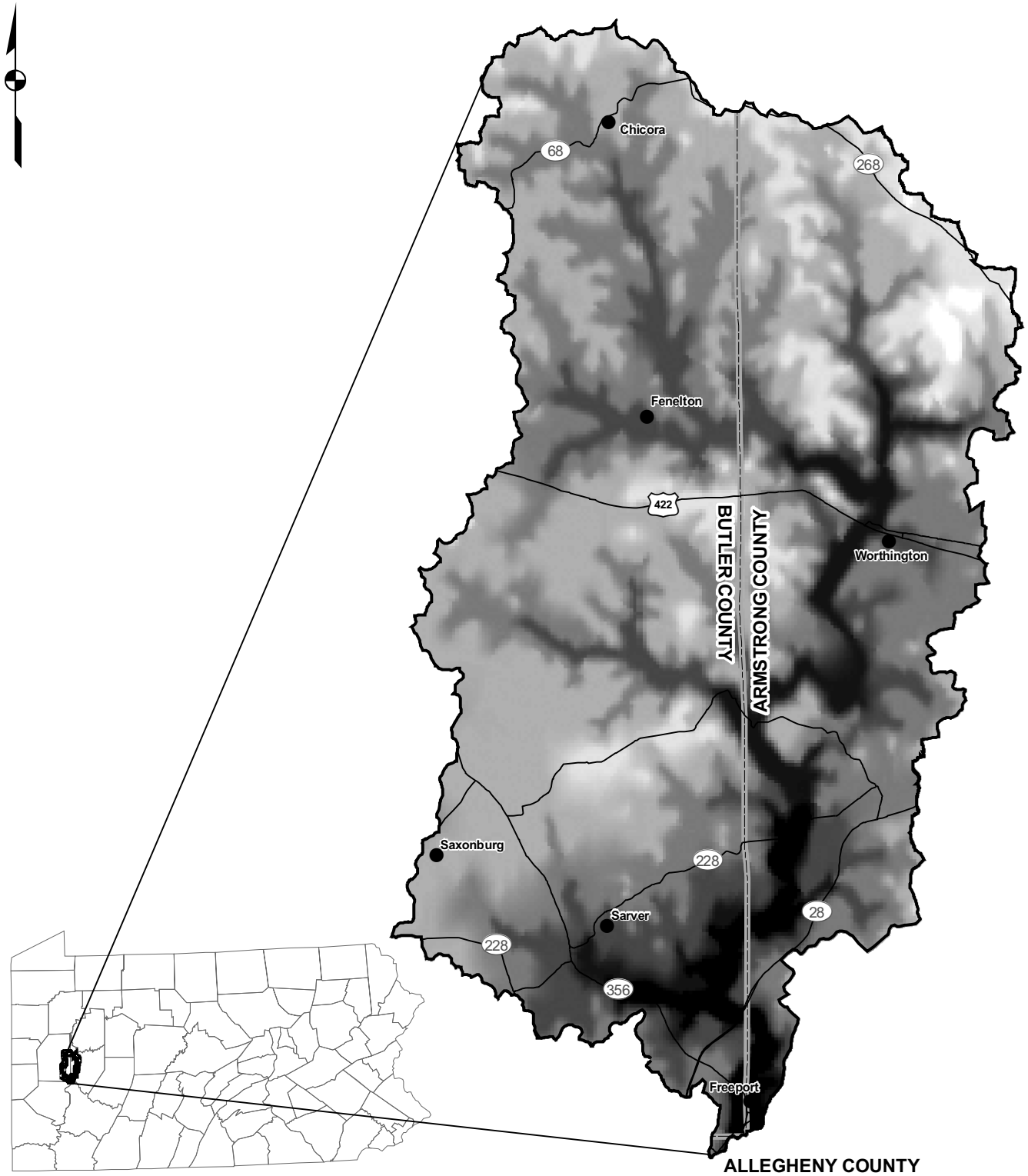
Mean annual temperature is 50.4° F (Miller 1995), with extremes ranging from -25° to 105° F in recent years. The mean annual precipitation is 36.3 inches, with the months from March to August averaging about 3.5 inches per month. The average daytime cloud cover is 71 percent, resulting in less than 60 clear days and more than 200 cloudy days per year. As noted by Miller (1995), the Appalachian Plateau of southwestern Pennsylvania is as cloudy as any area in the contiguous 48 states.

1.2 TRIBUTARIES

The Buffalo Creek Watershed is composed of a number of smaller subwatersheds. For descriptive and planning purposes, seven major subwatersheds have been identified as described in Table 1-1 and shown on Figure 1-2. These are discussed in further detail in Section 3. The major tributaries of Buffalo Creek within each subwatershed are also identified in Table 1-1.

Table 1-1
SUBWATERSHEDS AND MAJOR TRIBUTARIES

Subwatershed	County	Major Tributaries
Upper Buffalo Creek	Armstrong, Butler	Buffalo Run
Central Buffalo Creek	Armstrong, Butler	Marrowbone Run
Patterson Creek	Armstrong	Long Run
Little Buffalo Run	Armstrong, Butler	
Rough Run	Armstrong, Butler	Rough Run North Branch Rough Run Long Run Sarver Run
Little Buffalo Creek	Butler	Little Buffalo Creek Sarver Run
Lower Buffalo Creek	Armstrong, Butler	Sipes Run Cornplanter Run Pine Run Watson's Run Bell's Run



LEG

- BUFFALO CREEK WATERSHED BOUNDARY
- MAJOR TOWNS
- MAJOR ROADS

0 7,500 15,000 Feet

FIGURE 2
TOPOGRAPHY MAP
BUFFALO CREEK WATERSHED

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1.3 SOCIOECONOMIC PROFILE

Twenty-one municipalities located in three counties are located wholly or partly within the watershed (Figure 1-3).

As noted by the Pennsylvania Department of Community and Economic Development (PDCED), while Pennsylvania's population is concentrated in larger metropolitan areas, population in urban centers is declining. In 1980, cities and boroughs contained 52 percent of the state's population. During the 1990s, population declined in urban areas, while growing in suburban and traditionally rural areas. Townships, which are typically more suburban and rural, grew by 10 percent during the 1990s. Meanwhile, cities lost four percent of their population during the 1990s, and boroughs lost two percent. The majority of western and northern tier counties had stagnant or declining population levels in the 1990s. Of the 19 Pennsylvania counties that experienced population loss between 1990 and 2000, 13 are located in either western or northern Pennsylvania. One notable exception is Butler County, which grew by 14.5 percent during this period. Butler County was the only county in western and northern Pennsylvania that exceeded the national rate of growth during the 1990s.

In 1990, the total population of communities located within the watershed was 62,330. This increased to 65,046 in 2000, a gain of four percent. As detailed in Table 1-2, the only Allegheny County municipality in the watershed, Harrison Township, lost 7.6 percent of its population in this timeframe. The Armstrong County communities grew by a total of 0.8 percent. These were led by Worthington Borough, with an 8.4 percent increase. The Butler County communities in the watershed grew by 9.8 percent. Highest growth rates were in Saxonburg Borough (17.4 percent), Jefferson Township (15.4 percent), and Winfield Township (11.8 percent).

The median age in Pennsylvania in 1999 was 38.0 years. As shown in Table 1-2, the median age of communities in the watershed typically is older than the state as a whole. In fact, only five municipalities were less than the median age for the state. All of these are in Butler County.

Median household income in 1999 for the Commonwealth of Pennsylvania was $40,106. Twelve of the 21 watershed communities were below this threshold (Table 1-2).

Table 1-3 identifies selected employment characteristics of communities in the watershed. As shown in the table, the construction/manufacturing sector is typically the largest individual employment sector in most communities. Conversely, the agriculture/forestry/mining sector typically employs less than five percent of the population.

1.4 EDUCATION

Seven school districts serve the watershed as identified in Table 1-4. Cumulatively, there are over 26,000 students attending these schools in 2007. There are no colleges or universities located within the watershed.

N

UPPER BUFFALO CREEK

PATTERSON CREEK

LITTLE BUFFALO RUN

CENTRAL BUFFALO CREEK

ROUGH RUN

LITTLE BUFFALO CREEK

LOWER BUFFALO CREEK

BUTLER COUNTY

ARMSTRONG COUNTY

ALLEGHENY COUNTY

LEGEND

SUBWATERSHED BOUNDARY

0 10,000 20,000 Feet

FIGURE 1-2
SUBWATERSHED BOUNDARIES
BUFFALO CREEK WATERSHED

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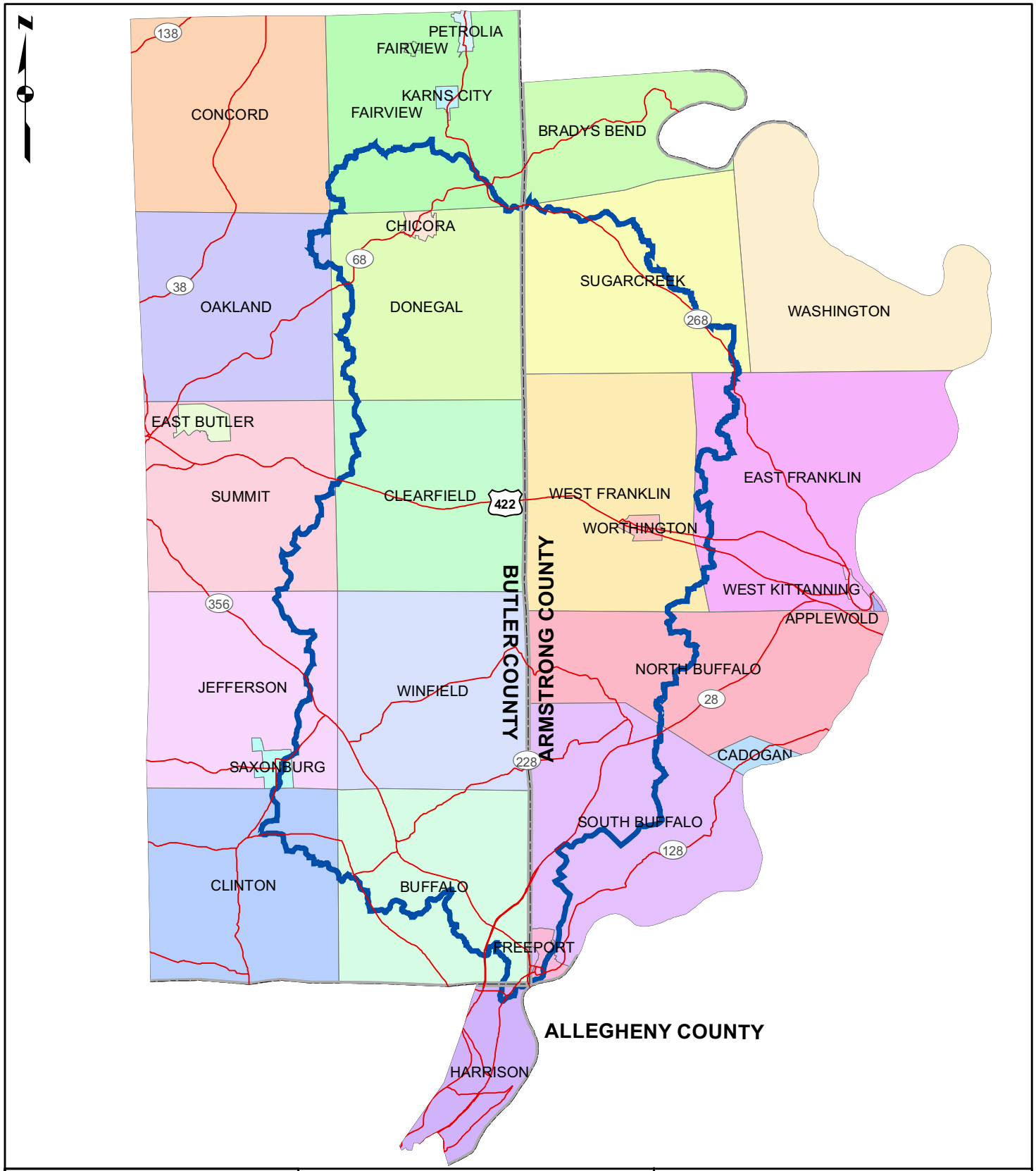
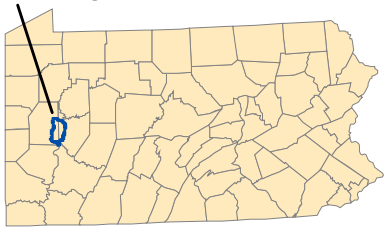


WATERSHED



LEGEND

- BUFFALO CREEK WATERSHED BOUNDARY
- TOWNSHIPS
- COUNTY BOUNDARY
- MAJOR ROADS

0 9,000 18,000 Feet

FIGURE 1-3
MUNICIPALITIES
BUFFALO CREEK WATERSHED

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Table 1-2
SOCIOECONOMIC PROFILE

Municipality	Area (sq. mi.)	Area in Watershed (sq. mi.)	Population 2000 Census	Population 1990 Census	Percent Population Change	Median Household Income	Median Age
ALLEGHENY COUNTY							
Harrison Township	7.8	0.1	10,934	11,763	(7.6)	33,482	42.6
ARMSTRONG COUNTY							
Brady's Bend Township	13.1	0.01	939	963	(2.6)	29,286	41.0
East Franklin Township	31.6	2.6	3,900	3,923	(0.6)	37,753	43.1
Freeport Borough	0.9	0.5	1,962	1,983	(1.1)	28,565	39.0
North Buffalo Township	25.5	9.2	2,942	2,897	1.5	37,375	40.3
South Buffalo Township	28.2	13.1	2,785	2,687	3.5	42,222	40.2
Sugarcreek Township	26.5	16.8	1,557	1,496	3.9	33,750	43.2
West Franklin Township	26.0	25.5	1,935	2,008	(3.8)	33,616	38.9
Worthington Borough	0.6	0.6	778	713	8.4	31,000	40.5
BUTLER COUNTY							
Buffalo Township	24.3	16.7	6,827	6,317	7.5	45,074	39.8
Chicora Borough	0.6	0.6	1,021	1,058	(3.6)	33,000	38.3
Clearfield Township	23.5	22.4	2,705	2,635	2.6	35,208	37.6
Clinton Township	23.8	2.8	2,779	2,556	8.0	44,494	39.1
Concord Township	24.8	0.01	1,493	1,336	10.5	40,134	36.8
Donegal Township	23.0	21.5	1,722	1,563	9.2	43,355	38.3
Fairview Township	24.2	5.7	2,061	2,009	2.5	41,146	37.4
Jefferson Township	23.3	5.0	5,690	4,812	15.4	42,885	41.5
Oakland Township	23.4	0.4	3,074	2,820	8.3	41,025	37.7
Saxonburg Borough	0.9	0.2	1,629	1,345	17.4	32,159	49.6
Summit Township	22.3	2.3	4,728	4,284	9.4	39,385	35.9
Winfield Township	24.5	24.5	3,585	3,162	11.8	42,180	40.0

Source: U.S. Bureau of the Census 2000.

Table 1-3
EMPLOYMENT DEMOGRAPHICS

Municipality	Percent of Total Employed Civilian Population by Sector				
	Agriculture/ Forestry/ Mining	Construction/ Manufacturing	Education/ Health/ Social Services	Retail Trade	Other
ALLEGHENY COUNTY					
Harrison Township	0.0	28.1	23.5	12.1	36.3
ARMSTRONG COUNTY					
Bradys Bend Township	6.3	38.3	22.4	4.8	28.2
East Franklin Township	3.5	28.3	24.0	16.7	27.5
Freeport Borough	0.0	22.9	24.7	17.6	34.8
North Buffalo Township	6.6	27.5	16.6	12.8	36.5
South Buffalo Township	3.6	33.4	17.4	10.9	34.7
Sugarcreek Township	5.7	33.4	22.1	10.4	28.4
West Franklin Township	10.5	30.0	18.9	8.2	32.4
Worthington Borough	8.2	25.6	22.6	10.6	33.0
BUTLER COUNTY					
Buffalo Township	1.2	24.4	24.3	13.9	36.2
Chicora Borough	1.7	30.7	20.3	15.1	32.2
Clearfield Township	4.8	34.5	16.8	10.6	33.3
Clinton Township	1.9	27.9	21.7	12.7	35.8
Concord Township	2.8	33.0	19.2	9.0	36.0
Donegal Township	1.7	35.9	18.4	12.3	31.7
Fairview Township	2.3	33.5	17.9	12.7	33.6
Jefferson Township	1.3	31.8	19.5	11.3	36.1
Oakland Township	2.1	30.3	18.0	15.0	34.6
Saxonburg Borough	0.3	23.5	27.7	11.6	36.9
Summit Township	2.7	35.0	14.6	11.2	36.5
Winfield Township	2.0	33.1	16.9	10.3	37.7

Source: U.S. Bureau of the Census 2000.

Farmland - Buffalo Township

Church - West Franklin Township

Table 1-4
SCHOOL DISTRICTS

School District	County	Watershed Municipality	Enrollment
Armstrong	Armstrong	East Franklin, West Franklin, North Buffalo, Worthington	6,634
Butler Area	Butler	Summit, Oakland, Clearfield	8,298
Freeport	Armstrong, Butler	Buffalo, South Buffalo, Freeport	1,899
Highlands	Allegheny	Harrison	3,004
Karns City Area	Butler, Armstrong	Sugarcreek, Brady's Bend, Donegal, Chicora	1,863
Moniteau	Butler	Concord	1,745
South Butler	Butler	Clinton, Jefferson, Winfield, Saxonburg	2,953

Source: PA Department of Education 2007.

1.5 LAND USE AND PLANNING

The shift of population from urban areas to more rural areas, such as the Buffalo Creek Watershed, consumes large amounts of land. As noted by the PDCED, Pennsylvania ranks fifth in the nation for change in the amount of land developed. According to the Pennsylvania Economy League, between 1982 and 1997 Pennsylvania consumed land at the fourth fastest rate among 13 competitor states even though it had the slowest population growth. In other words, a greater amount of land is being consumed for a fewer number of people than in other areas.

Land use in Pennsylvania is primarily controlled through local zoning ordinances. Overall direction is often provided through comprehensive plans that identify county or municipal policies and identify conceptual land use plans. Local subdivision ordinances are used to control and direct development activities and construction methods. Under the Municipalities Planning Code (MPC), all counties in Pennsylvania are required to develop and adopt a comprehensive plan, and to update their plans every 10 years. As noted by the PDCED, current county comprehensive plans are critical if good planning is to occur. Within the Buffalo Creek Watershed, all three counties possess comprehensive plans and subdivision ordinances in draft or approved formats. The Allegheny County comprehensive plan is currently a draft document in its final stages before being presented for approval, the Armstrong County comprehensive plan was adopted in 2005, and the Butler County comprehensive plan was adopted in 1997 (Phase I) and 2002 (Phase II).

The MPC does not mandate municipalities to plan or zone, but does encourage municipalities to adopt municipal or multi-municipal plans that are consistent with the respective county comprehensive plan. In Pennsylvania the power and responsibility to plan for land use and its regulation lies exclusively with local government, which is exercised through authority granted to municipal officials. Although each county has a subdivision ordinance, it is only applicable in municipalities that have not adopted their own subdivision ordinance.

Since most land use decisions are made at the municipal level, counties with good comprehensive plans can help guide and encourage municipal officials to make wise land use decisions that benefit both the municipality and the county. Counties without current comprehensive plans are frequently unable to assist their municipalities with sound planning decisions, the development process is inherently reactive, and resulting development is

piecemeal and uncoordinated. Municipalities within the Buffalo Creek Watershed can look to Allegheny, Armstrong, and Butler Counties for current guidance as each county's plan is dated within the last 10 years.

Of the 21 municipalities in the watershed, 12 have comprehensive plans, 11 have zoning ordinances, and 11 have subdivision ordinances. Table 1-5 summarizes the regulatory status of each municipality. The municipal land use controls currently in place range in date from as early as 1967 to as recent as 2006, while some municipalities lack plans and regulations completely. As stated previously, the MPC encourages municipalities to adopt municipal or multi-municipal plans that are consistent with the respective county comprehensive plans. The MPC suggests that municipal and multi-municipal plans be reviewed at least every 10 years and at the time of review the plans be sent to the contiguous municipalities for review and comment. A number of communities have outdated plans according to this criterion. These include Harrison Township (1969), Sugarcreek Township (1987), Jefferson Township (1968), Saxonburg Borough (1968), and Winfield Township (1968). The MPC recommends that municipalities with current comprehensive plans maintain a continuing planning process. This would be appropriate for recently developed plans including East Franklin and South Buffalo Townships (2003), Freeport Borough (2005), North Buffalo Township (2004), West Franklin Township (2005), Worthington Borough (2005), and Buffalo and Clinton Townships (2006).

Beyond preparing or updating a comprehensive plan, which is an overall policy guide for physical development, municipalities can take advantage of the enabling legislation within the MPC and adopt ordinances to aid in implementing the plans and shaping land use programs according to current community goals. While the MPC does not outline a specific timeframe within which zoning ordinances must be reviewed or updated, the intent is for zoning to be oriented to the present. As municipal comprehensive plans are created or updated, the zoning ordinance should concurrently be created, or reviewed and updated as needed. Because a zoning ordinance is a tool for implementing a comprehensive plan, the ordinance should be preceded by the development of a comprehensive plan.

South Buffalo Township

Allegheny County is currently preparing a comprehensive plan. In addition, there is a county-wide Subdivision and Land Development Ordinance available for the use of all of its municipalities.

Table 1-5
SUMMARY OF LAND USE CONTROLS

Municipality	Land Use Controls		
	Comprehensive Plan	Zoning	Subdivision Ordinance
ALLEGHENY COUNTY			
County	Draft	N/A	N/A
Harrison Township	Yes (1969)	Yes	Yes
ARMSTRONG COUNTY			
County	Yes (2005)	No	Yes
Bradys Bend Township	No	No	No
East Franklin Township	Yes (2003)	Yes	No
Freeport Borough	Yes (2005)	Yes	No
North Buffalo Township	Yes (2004)	Yes	No
South Buffalo Township	Yes (2003)	Yes	No
Sugarcreek Township	Yes (1987)	Yes	Yes
West Franklin Township	Yes - Joint with other municipalities (2005)	No	No
Worthington Borough	Yes (2005)	No	No
BUTLER COUNTY			
County	Yes (1997, 2002)	NA	Yes
Buffalo Township	Yes - Joint with Clinton Township (2006)	Yes	Yes
Chicora Borough	No	No	No
Clearfield Township	No	No	Yes
Clinton Township	Yes - Joint with Buffalo Township (2006)	Yes	Yes
Concord Township	No	No	No
Donegal Township	No	No	Yes
Fairview Township	No	No	No
Jefferson Township	Yes (1968)	No	Yes
Oakland Township	No	No	Yes
Saxonburg Borough	Yes (1968)	Yes	Yes
Summit Township	No	Yes	Yes
Winfield Township	Yes (1968)	Yes	Yes

Source: GAI 2008.

Armstrong County has a comprehensive plan that was completed in 2005. In addition, there is a county-wide subdivision ordinance available for the use of all of its municipalities. County municipalities have been divided into six planning regions to create areas of manageable size. Each region is responsible for a multi-municipal comprehensive plan, zoning ordinances, and other land use planning tools with technical assistance provided by the County Department of Planning and Development. These plans are in various stages of development.

Butler County has a comprehensive plan that was completed in 2002. In addition, there is a county-wide subdivision ordinance available for the use of all of its municipalities.

It should be noted that county-wide subdivision ordinances only apply to those municipalities lacking their own.

1.6 INFRASTRUCTURE

The Pennsylvania Sewage Facilities Act (Act 537) requires that all municipalities develop and implement comprehensive official plans that provide for the resolution of existing sewage disposal problems, provide for the future sewage disposal needs of new land development, and provide for the future sewage disposal needs of the municipality. All watershed communities have an Act 537 Plan for sewage management. The majority of these plans are 20 years old or more. Six community sewage systems serve higher population areas within the watershed. Each county within the watershed has an agency designated to enforce Act 537 Plans. Further detail on sewage disposal is contained in Section 3.

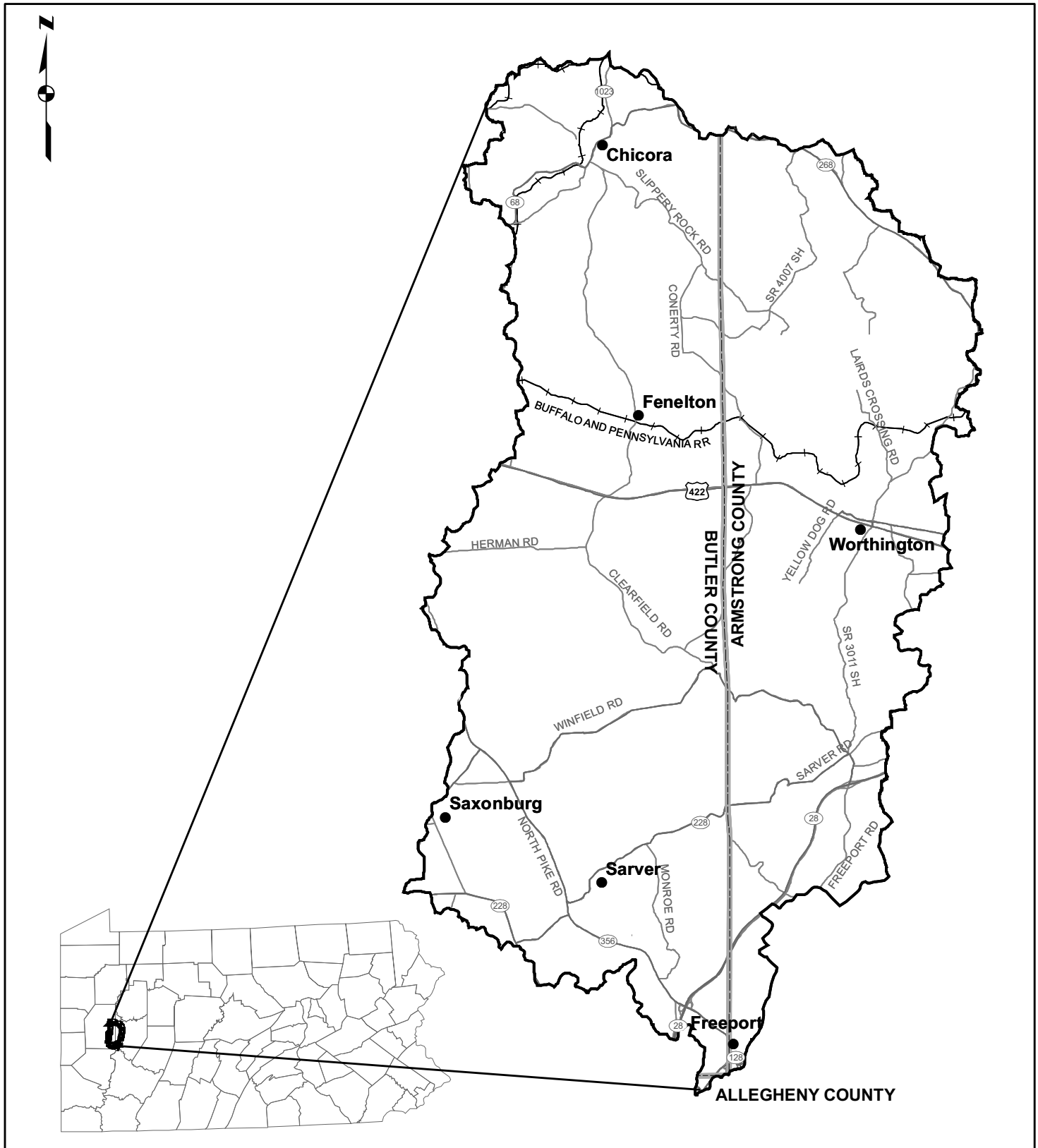
Residents and businesses in the majority of the watershed rely on private wells to supply potable water needs. Ten community suppliers provide water to limited areas of high population density as identified in Section 3.

1.7 TRANSPORTATION SYSTEM

The watershed is adequately served by a number of arterial and major collector roads (Figure 1-4). Major highways in the watershed include U.S. Route 422, State Routes 28 (the Allegheny Valley Expressway), 68, 228, 268, and 356. U.S. Route 422 and State Route 28 are four lane highways, the remainder are usually two lanes. These major highways typically are located in higher elevation areas on the drainage divides between minor subwatersheds. The remainder of the roadways in the watershed often follow streams.

Railroad lines were formerly much more extensive in the watershed than they are presently. Many former rail lines have been abandoned or developed into rail trails. The Conemaugh Division of the Norfolk Southern Railroad (between Pittsburgh and Johnstown) follows the Allegheny River and passes through Freeport. The Buffalo and Pittsburgh Railroad (running between New Castle and Punxsutawney) bisects the watershed from west to east by following Little Buffalo Run, a short section of Buffalo Creek, and Long Run.

There are no public airports within the watershed. At least one private landing strip, the Lindsay Landing Strip in South Buffalo Township, is in the watershed.



LEGEND

- BUFFALO CREEK WATERSHED BOUNDARY
- MAJOR TOWNS
- RAILROADS
- ROADS

0 7,500 15,000 Feet

FIGURE 1-4
TRANSPORTATION SYSTEM
BUFFALO CREEK WATERSHED

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SIDEBAR:

The Watershed From The Air

The Buffalo Creek gorge near Iron Bridge

Farmlands near Worthington