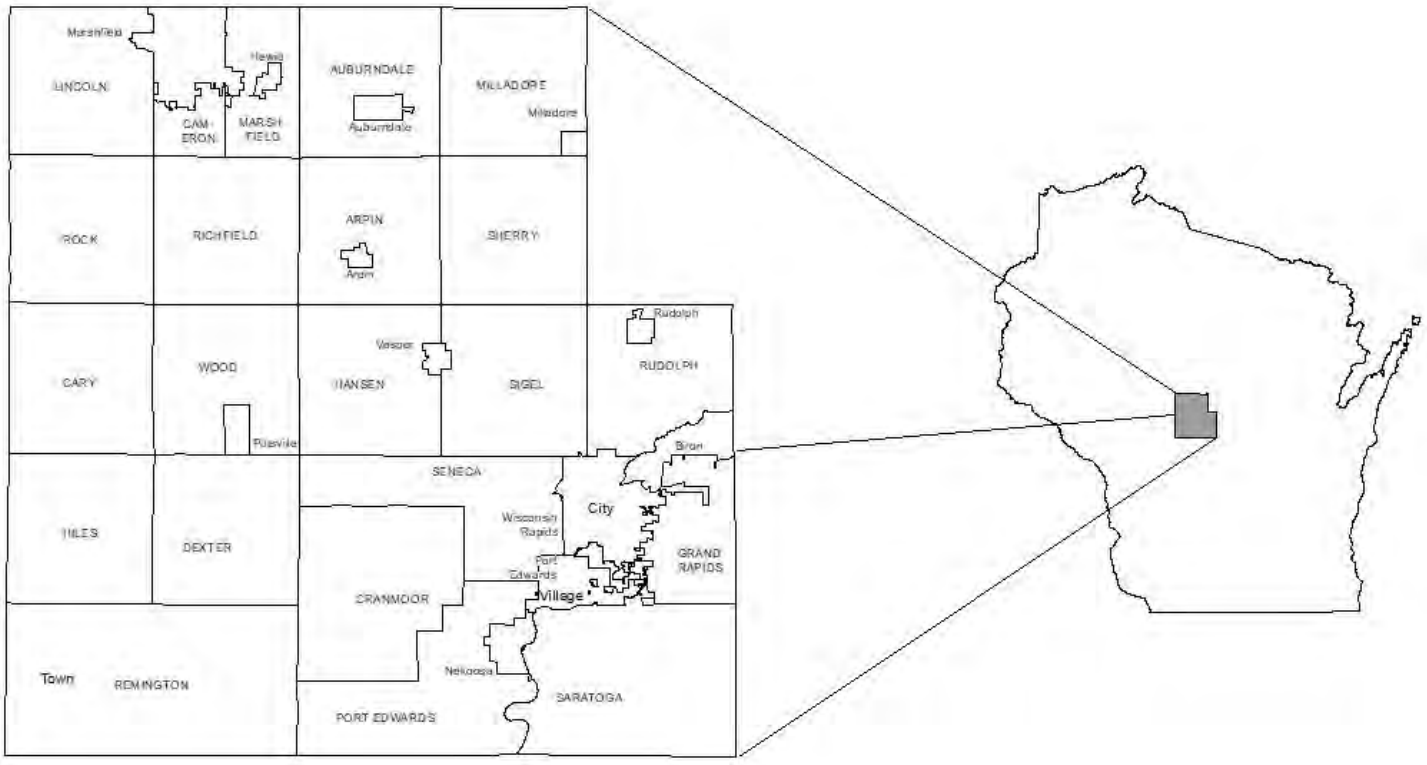
Chapter 2:
BACKGROUND OF WOOD COUNTY

2.1 Physical Characteristics

This section describes the physical features that make up Wood County. Recreation planners use this kind of data to determine which resources to develop and which resources to protect or preserve. From the rolling highlands of northern Wood County to the sandy central plain of southern Wood County, the county provides a diverse landscape with a significant amount of recreational resources. Lakes, rivers, forests, wetlands, parks, recreation areas, and open spaces allow residents and visitors opportunities to enjoy a variety of recreational activities.

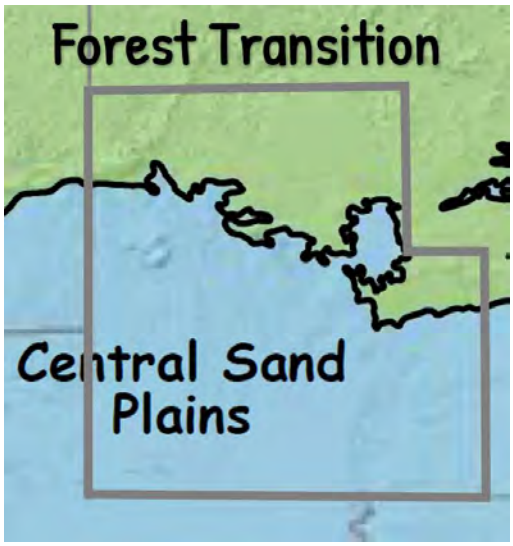
Wood County is located in the geographic center of Wisconsin (see **Figure 1**). The total area of the county is approximately 517,846 acres, or about 809 square miles. The county boundary measures approximately 30 miles from north to south and 29 miles from east to west. The county is bordered on the north by Marathon County, on the east by Portage County, on the south by Adams and Juneau counties, and on the west by Jackson and Clark counties.

Figure 1 **Wood County**



Ecological Landscapes and Geology

As part of the Wisconsin Land Legacy Report, 16 ecological landscapes were identified that make up the whole state. The Wood County Soil Survey provides the general geology within each ecological landscape.



Source: Wisconsin Land Legacy Report

Forest Transition – The roughly northern 1/3 of Wood County's landscape was almost entirely covered with mesic to wet-mesic forests of hemlock and sugar maple, with some yellow birch, red pine, and white pine. There were pockets of conifer swamps, often near the headwaters of streams like the Marshfield area, containing white cedar, black spruce and tamarack. (Land Legacy Report)

There are a number of low depressions in this region of the County that create large wooded wetlands providing recreational hunting lands which are publicly owned. Two examples of such wetlands include the Sherry Flats and the Mead Wildlife Area.

In general, the Forest Transition portion has long, gentle slopes. The underlying bedrock consists of Precambrian igneous and metamorphic rocks. The western half of this area has a mantle of heavy loam glacial till over the bedrock. The rest of this area has a layer which varies in thickness of loamy residuum weathered from the Precambrian rock that is over the bedrock. Stream valleys in the glaciated part of the area are broad and shallow, and those in the residual part tend to be narrow and steep sided. The entire area was covered by a layer about 2-feet thick of wind deposited silt during the Wisconsin Glaciation. The soils formed partly in the silt and partly in the underlying till or residuum. (Soil Survey)

Source: John W. Attig, UW-Madison (emerit) and Eric Carson, WGNHS Geologist

Central Sand Plains – The dominant feature in this landscape is the vast, remarkably flat, sandy plain that was once the bed of Glacial Lake Wisconsin—the enormous body of water fed primarily by glacial runoff. This lake, ringed by the Driftless Area to the southwest and the glacier to the north and east, was 70 to 150 feet deep and covered over 1,800 square miles. Streams and rivers draining from the glacier into the lake carried enormous loads of sand, silt, and clay that settled onto the lake bottom. The lake is believed to have drained catastrophically, in an estimated 7 to 10 days, when the

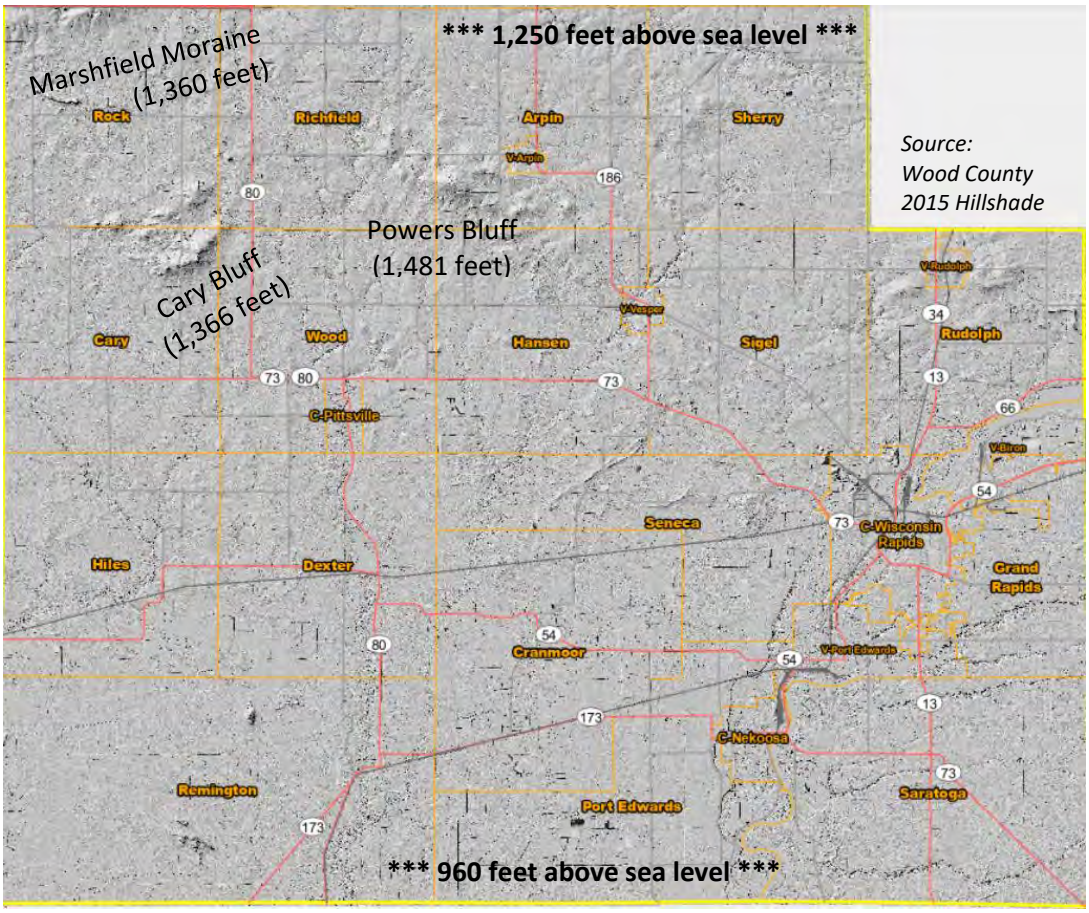
ice dam along its southern end failed. This flush of water out of the lake carved the spectacular narrow, deep-sided gorges at Wisconsin Dells. (Land Legacy Report)

The southern one third of the County is situated on the lake plain of Glacial Lake Wisconsin. This low, sandy region is home to very large wetland areas, conifer forest tracks, and over 5,300 acres of cranberry marshes. While the southeast corner of Wood County is somewhat urbanized, the south central and southwestern regions of the county are sparsely populated and relatively undisturbed.

The Central Sand Plains consists of nearly level to gently sloping uplands associated with occasional low ridges and hills of sandstone, and of broad areas of sandy outwash plains and lake plains. The bedrock in this area consists of Cambrian sandstone interbedded with varying amounts of shale. The shale layers are generally thin or absent in parts of Sigel and Hansen Townships but are thick and very prominent in the western part of the county. Glacial till covers the sandstone and shale in the northwestern part of the county and on a few broad, low ridges south of Powers Bluff, but the rest of this area is residual. One to two feet of loess covers all of the area except the lake plain and outwash parts. (Soil Survey)

Powers Bluff, the highest elevation in the county, is a mass of Precambrian rock capped by extremely resistant quartzite. Cary Bluff and a somewhat smaller hill in the Sandhill Crane Wildlife Area in the Town of Remington, although on the Central Plain and surrounded by Cambrian sandstone, are Precambrian rock that lacks the quartzite cap of Powers Bluff. (Soil Survey)

Topography



Wood County mainly ranges from 1,250 to 960 feet above sea level.

Surface elevations decrease, from north to south. This slope is interrupted by the Marshfield Moraine (1,360 feet), Powers Bluff (1,481 feet), Cary Bluff (1,366 feet), as well as a few lower hills.

The highest point in the county is Powers Bluff located in the Town of Arpin. It rises 300 to 400 feet above the surrounding area and also happens to be a county park.

Soils

The soils in the northern two-thirds of Wood County formed in "two-storied" parent material. That is, the upper 20 to 26 inches of the soils formed in silty wind-laid material, and the lower part of the soils formed either in glacial till or in residuum weathered from underlying bedrock. (Wood County LWRMP)

If a line were drawn east and west approximately through Wisconsin Rapids, it would roughly separate the loamy soils north of the line from the sandy soils south of the line. The loamy soils have a cap of wind laid silty material that averages about 24 inches in thickness. (Wood County LWRMP)

In the northwestern part of the county, the soils formed partly in the underlying loamy glacial till. These are soils of the Withee, Marshfield, Santiago, and Mann series. (Wood County LWRMP)

In the northeastern part of the county, the material below the silty cap is loam residuum weathered from the underlying gneissic rock. Milladore, Eau Pleine, and Sherry soils formed in this silt and residuum. (Wood County LWRMP)

A broad belt across the middle of the county is soils that formed in the silty cap and underlying layers of residuum from weakly cemented sandstone and acid clay shale. These are soils of the Kert, Vesper, Hiles, and Veedum series. (Wood County LWRMP)

Most of the soils in the southern part of the county formed in sandy material deposited by glacial melt waters along the Wisconsin River or in Glacial Lake Wisconsin. Soils of the Nymore, Plainfield, Friendship, Meehan, and Newson Series formed in these materials. (Wood County LWRMP)

Surface Water

The Wood County recreation system has utilized the surface water of reservoirs extensively. Many cities and villages have also developed park and recreation areas along water fronts.

The quality of water resources is important to sustaining a healthy wildlife population and creating a safe and desirable place for outdoor recreation. Clean water provides an environment for aquatic species to thrive and reproduce in. When a water body experiences problems with pollution or lack of oxygen, many other plants and animal species that live on, in or near water bodies suffer as a result.

Clean surface water is also important to water recreation activities including swimming, boating and fishing. In Wood County water related recreation activities are very popular and are a contributing factor to the overall quality of life of the area. Clean lakes, rivers and streams also help the economy by drawing tourists to the area to recreate and vacation. Generally, the water quality of the lakes, rivers and streams in the county is good.

According to the Wisconsin Department of Natural Resources, Wood County has 78 lakes totaling over 6,240 acres. Of the 78 lakes, 13 lakes are named and 65 lakes are unnamed. Additionally, the county has over 100 unnamed lakes that are smaller than 20 acres. Ross Lake is the only named seepage lake in the county. The remaining named lakes are classified as drainage lakes. These lakes have both an inlet and outlet where the

main water source is a stream. The main drainage lakes in the county are created by dams and are considered flowages, impoundments or reservoirs. These man-made lakes and flowages provide most of the recreational water in the county. Natural lakes in the county are generally small and very shallow with recreation potential mainly centered around wildlife, waterfowl and fishing.

The Wisconsin River is the county's most prominent water feature, and it is identified by 5 flowages: Biron Flowage, Wisconsin Rapids Flowage, Centralia Flowage, Port Edwards Flowage, Nekoosa Flowage; and the tail of the Petenwell Lake. Although legally considered a river, the Wisconsin River is included with the lake inventory because of the large surface area that it covers that is more typical of a lake than a river. Although contiguous, the Wisconsin River flowages are somewhat confined water features separated by 4 dams that control the rate of water flow for power generation and regulating seasonal flow.

There are 82 named streams/creeks in Wood County totaling approximately 390 miles in length. The Yellow River is the longest in the county, but the Wisconsin River has the largest surface water acreage.

Climate

The climate of Wood County is typical of the center of the continent in the middle latitudes. Winters are long, cold, and snowy; summers are warm and occasionally humid; and spring and fall are sometimes short and are a mixture of summer and winter. (Wood County Soil Survey, 1977)

Like much of the Midwest, Wood County has experienced increasing temperatures and precipitation in recent decades. Warming has been concentrated in the winter and spring, while summers have warmed less. Warmer spring temperatures present the additional threat of frost-freeze damage to early-budding fruit trees. The lack of summer warming is reflected in a below average occurrence of very hot days and no overall trend in warm nights. The number of very cold days has been near or below average since 2000, reflecting a winter warming trend. The increase in winter temperatures has also reduced lake ice cover. Precipitation varies widely from year to year, and most of the state’s precipitation falls during the warmer half of the year. (Excerpt from NOAA State Climate Summaries - Wisconsin 2022)

Total winter precipitation and total summer precipitation have been mostly above average over the last 26 years. The frequency of 2-inch extreme precipitation events has increased, with the highest number occurring during the 2015–2020 period. Annual snowfall totals have increased over the rest of Wisconsin since 1930. (Excerpt from NOAA State Climate Summaries - Wisconsin 2022)

<u>Projected Future Climate Trends</u>

Wood County, like the rest of Wisconsin, is projected to continue warming in the future, with winters warming more rapidly than other seasons (Wisconsin Initiative on Climate Change Impacts 2021 Assessment Report). With warming winters, Wood County can expect to see fewer nights per year with below-freezing temperatures and with a warming climate comes a shift in lakes predictably freezing over from annually to intermittently. Lake Mendota (Dane County) will likely have intermittent ice by 2040. Trout Lake (Vilas County) will likely start having intermittent ice by 2100. (John J. Magnuson et al, Center for Limnology, UW-Madison, 2019)

Precipitation is projected to continue increasing in Wood County and the rest of Wisconsin. Most of the precipitation increase is projected to occur during the winter and spring, but snowfall is projected to decline due to warmer temperatures. Additionally, extreme precipitation is projected to increase, potentially increasing the frequency and intensity of floods and causing increased runoff and erosion. Above normal precipitation enhances the risk of springtime flooding, which could pose a threat to Wisconsin's agricultural industry by delaying planting and causing yield losses. (Excerpt from NOAA State Climate Summaries - Wisconsin 2022)

The intensity of future droughts is projected to increase. Even if precipitation increases in the future, rising temperatures will increase the rate of soil moisture loss during dry periods. Thus, future summer droughts, a natural part of Wisconsin's climate, are likely to be more intense. (Excerpt from NOAA State Climate Summaries - Wisconsin 2022)

Groundwater

Groundwater is an extremely important resource in Wood County as it is the source of the entire county's drinking water supply and serves many agricultural, commercial, and industrial purposes. Because of its importance, a greater understanding of groundwater is needed to gauge existing and potential threats to its quantity and quality.

Contamination of groundwater almost always results directly from land uses associated with modern society. Almost anything which can be spilled or spread on the land has the potential to seep through the ground and enter the groundwater. The impacts of improper land uses or waste management are usually determined by the physical characteristics of that area. By locating, constructing, and operating development and waste management systems appropriately, these negative effects can be minimized.

The Wisconsin Geological and Natural History Survey (WGNHS) provides the following groundwater information from their 1989 publication titled: Hydrogeology of Wood County, Wisconsin.

Elevated hardness, iron, and manganese concentrations are the most common water-quality problems in the county. Ground water has relatively low alkalinity because of small amounts of carbonate minerals in rocks and unconsolidated deposits in the county.

Precambrian rock, unconsolidated sand and gravel deposits, and Cambrian sandstone provide virtually all ground water used in Wood County. Saturated thicknesses of permeable sand and gravel deposits adequate for water supply occur only in the southeastern part of the county and in an isolated area in the northwestern part of the county. These deposits are capable of yielding 500 gal/min or more in some areas. Residents in more than two-thirds of the county area depend on fractured or weathered Precambrian rock for ground-water supplies. However, limited amounts (generally less than 5 gal/min) of water generally are available from this rock; this causes a water-availability problem in much of the county.

2.2 Social Characteristics

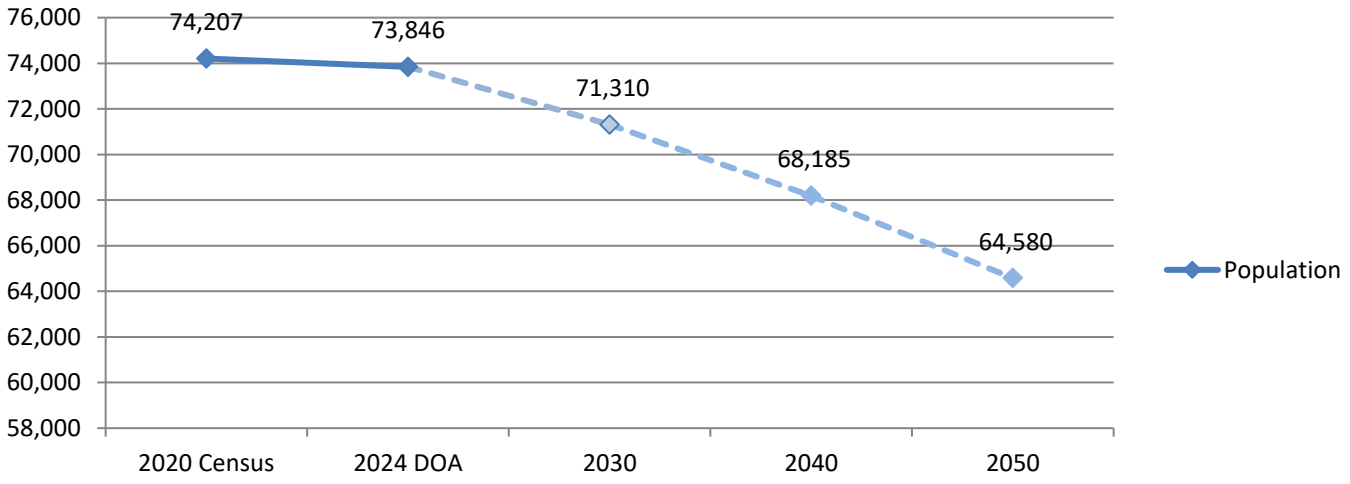
Introduction

This section describes social and economic demographic information that influences Wood County. Overall recreation demand within Wisconsin is described in SCORP, under Reference Plans in Chapter 1. The social characteristics and growth information from this section combined with recreation demands as shown in Western Sands SCORP region can help determine the appropriate recreation investments in the County.

Population

The 2023 American Community Survey (ACS) 5-Year Estimates total population of Wood County is 74,039. This 100% count shows an increase of approximately 3,758 people since the 2020 Census. Wood County's population decreased by 0.9 percent while the state grew by 9.8 percent and the nation grew by 7.7 percent between 2010 and 2023. The population of Wood County is expected to decline through 2040 (see **Figure 2**).

Figure 2: Wood County Population Projections



Source: U.S. Census 2020, Wisconsin Department of Administration
2024 Estimate, Wisconsin DOA 2024 projections

Changes in population are made up of two components. More births than deaths produce a natural increase, and more people moving into an area than moving out produces a migration increase. The combination of these two factors makes up increases or decreases in population. Wisconsin's Demographic Services Center estimates Wood County's 2024 population at 73,846. Wood County's natural increase in 2024 was a decrease of 1.3%; unlike the state's natural increase of 0.01%. The decreased natural increase may be a reflection of more deaths than births in the county. Net migration for Wood County was 0.8%, which is the sole reason why Wood County's population increased in 2023. This net migration for the County was considerably higher than the state rate of 0.1%. Net migration has an immediate impact on a county's labor force potential, while natural increase provides some insight into a county's long-term workforce pipeline. Natural increase is largely a function of age

and is expected to decline in the coming decades because the state's fertility rate has been below replacement level since 1975. (WDOA, DSC)

Table 1	Populations & Projections			
Municipality	**2020 Census**	**2024 Estimate**	**2030 Projections**	**2040 Projection**
City of Marshfield	18,119	17,927	17,172	16,182
City of Nekoosa	2,449	2,407	2,272	2,092
City of Pittsville	813	821	789	763
City of Wisconsin Rapids	18,877	18,659	18,183	17,429
Village of Arpin	305	300	279	253
Village of Auburndale	702	726	695	685
Village of Biron	839	855	845	846
Village of Hewitt	796	798	773	747
Village of Milladore	268	265	253	237
V. Port Edwards	1,762	1,743	1,646	1,527
Village of Rudolph	433	428	413	391
Village of Vesper	513	515	485	457
Town of Arpin	942	950	922	899
Town of Auburndale	790	785	729	667
Town of Cameron	539	544	545	548
Town of Cary	406	404	390	373
Town of Cranmoor	181	178	176	170
Town of Dexter	350	352	335	318
Town of Grand Rapids	7,576	7,609	7,420	7,233
Town of Hansen	747	741	748	746
Town of Hiles	152	150	141	129
Town of Lincoln	1,593	1,605	1,576	1,552
Town of Marshfield	763	770	759	751
Town of Milladore	668	661	626	582
Town of Port Edwards	1,356	1,351	1,278	1,197
Town of Remington	230	226	204	178
Town of Richfield	1,596	1,599	1,558	1,514
Town of Rock	787	797	753	716
Town of Rudolph	1,027	1,016	985	940
Town of Saratoga	5,060	5,105	4,971	4,861
Town of Seneca	1,039	1,028	964	887
Town of Sherry	755	756	722	688
Town of Sigel	1,017	1,016	980	939
Town of Wood	757	759	723	688
Wood County	**74,207**	**73,846**	**71,310**	**68,185**

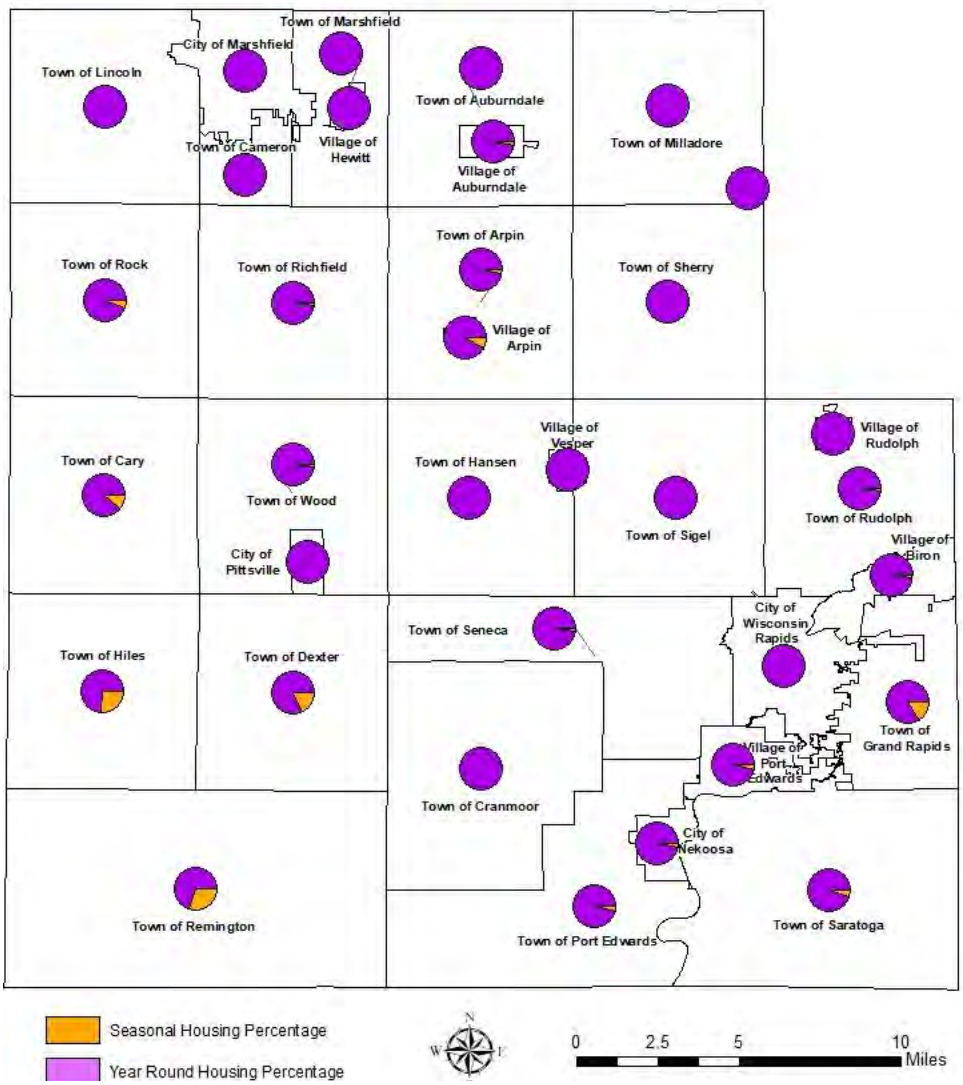
Source: U.S. Census 2020; WDOA Preliminary Jan. 1, 2024, Population Estimates; WDOA 2013 Population Projections

Table 1 shows three parts of the population for all the local governments within Wood County. The 2020 Census population comes from the 100% count decennial Census. Wisconsin Department of Administration (WDOA) created the 2024 Estimates, which are preliminary Jan. 1, 2024 numbers. Projections come from the now dated numbers that WDOA created in 2024 from the 2020 Census. New projections are very late.

Household sizes have slightly decreased over time in Wood County, similar to national and state trends where household sizes have also decreased. Wood County had 31,979 households as of the 2010 Census, and an average household size of 2.31 people. By 2023, the average household size within Wood County has decreased to 2.29 people. About 24% of households have someone under 18 years old, and about 35% of households have someone 65 or older. About 62% of households are families, and just over 24% have their own children under 18 years old.

Wood County has a smaller proportion of vacant housing than Wisconsin or the United States per the 2023 American Community Survey (ACS) 5-Year Estimates. Some of these vacant housing is seasonal housing a.k.a. "up north cabins" (see **Figure 3**). In 2023, approximately 2% of the housing in Wood County was seasonally vacant compared to approximately 6.4% in Wisconsin and 3.4% in the United States. There are some concentrations of seasonal housing in Wood County near a couple of small lakes and along the Wisconsin River. These areas will have greater fluctuations in population throughout the year, and these seasonal residents must be included when determining the demand for recreation facilities.

Figure 3: Year-Round and Seasonal Housing, 2023

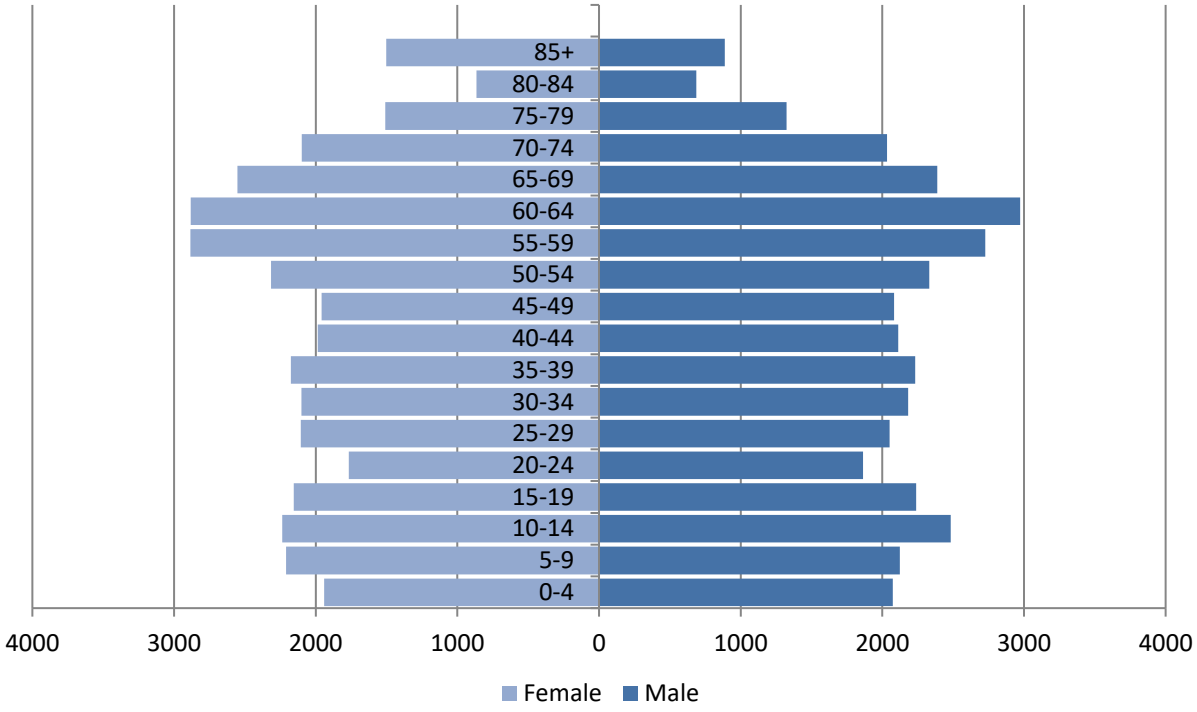


Age

The median age of Wood County is 43.9 years old, while Wisconsin is 40.1 years old. The median age has increased in both Wood County and Wisconsin between 2010 and 2023, from 42.0 and 38.1 years old, respectively. **Figure 4** shows the distribution of age groups in Wood County. In Wood County, the largest age concentration is the 60-64 year old group. There is also a concentration of people in the middle-aged 50-69 year old age groups. Usually, the most heavily concentrated age groups are very near to the typical retirement age, which will likely have a great effect on the parks and recreation needs of the County. Females outnumber males in the age groups above 60.

Understanding the needs of younger adults is important in ensuring there are adequate recreational amenities. Younger people tend to be very active and prioritize physical activities like hiking, biking, and gym activities. Similarly, research has demonstrated that recently retired people tend to be very active and are attracted to places with recreational amenities. As retirees age, they tend to become less active, with many eventually moving to more urban areas where services such as health care are in closer proximity and more accessible. Overall, Wood County has a healthy balance of age group distribution (see **Figure 4**), with each age group having varied recreational needs.

Figure 4: Wood County Age Pyramid, 2023



Source: 2023 American Community Survey

Ethnic Background

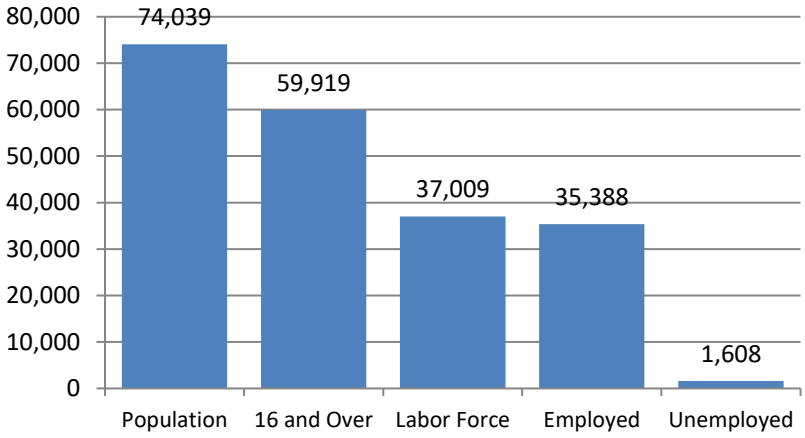
The people of Wood County mostly identify as white, at approximately 92.0% of people. About 0.8% identify as Black or African American and about 1.8% identify as Asian. About 0.3% as American Indian or Alaska Native, 1.1% as some other race, and 4.1% as two or more races. Approximately 3.5% identify as Hispanic or Latino ethnicity.

Employment and Economy

Wood County has a diverse economy with major industries including healthcare, manufacturing (particularly paper), and agriculture (especially cranberries and dairy).

Wood County has 59,919 people age 16 and over, 61.8% of which are in the labor force, i.e., actively working or seeking work. See **Figure 5**. The labor force participation rate for Wisconsin as a whole is 65.5%; higher than Wood County. According to the 2023 ACS, the unemployment rate in Wood County was 4.3%; higher than the 3.3% in the state and lower than the 5.2% in the United States.

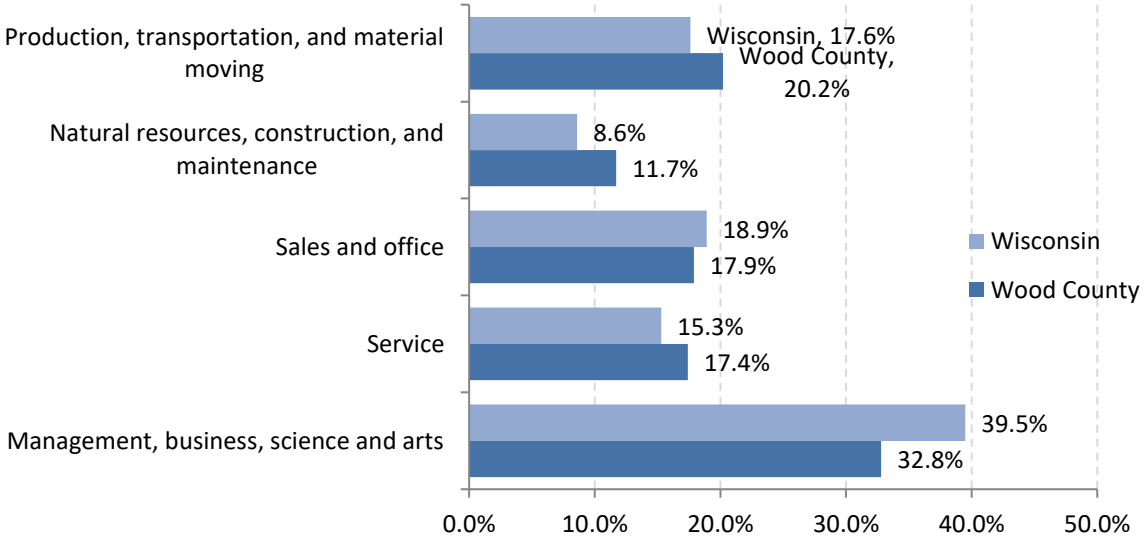
Figure 5 Wood County Employment, 2023



Source: 2023 American Communitv Survev

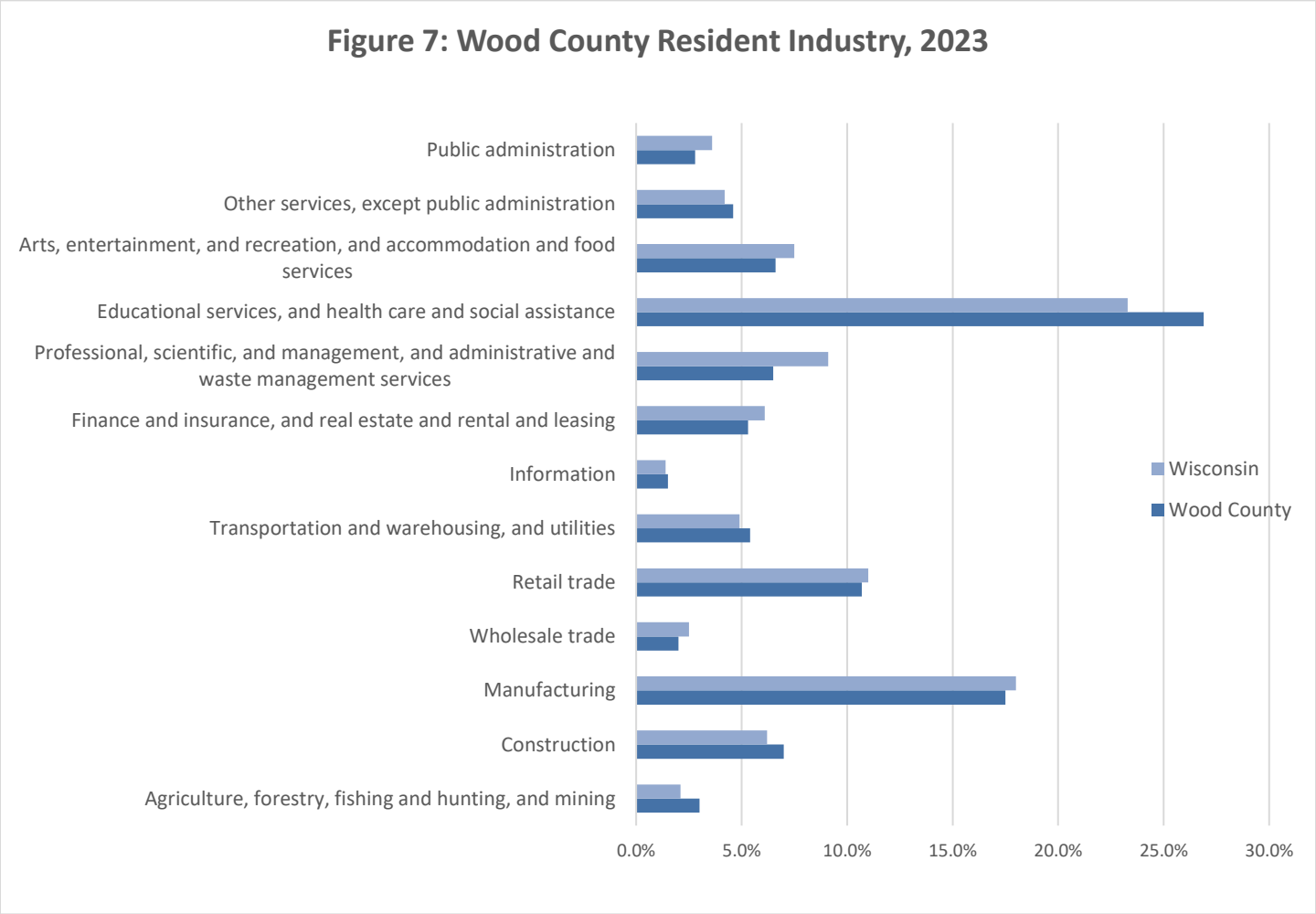
As shown in **Figure 6**, most residents of Wood County are employed in *Management, business, science and arts* occupation at 32.8%; *Sales and office* occupation at 17.9%; the *Production, transportation, and material moving* occupation at 20.2%. Wood County has a higher proportion of residents in the *Service* occupation as well as the *Natural resources, construction, and maintenance* occupation; but a lower proportion of the *Sales and office* occupation and *Management, business, science and arts* occupation.

Figure 6: Wood County Resident Occupation, 2023



Source: 2023 American Community Survey

Figure 7 shows the most common industry for Wood County residents as *Education services, health care and social assistance*, which is a higher proportion than the state; followed by the *Manufacturing* industry. Wood County also has a higher proportion of residents in the *Construction;* and *Agriculture, forestry, fishing, and hunting, and mining* industries, as well as *Transportation and warehousing, and utilities*.

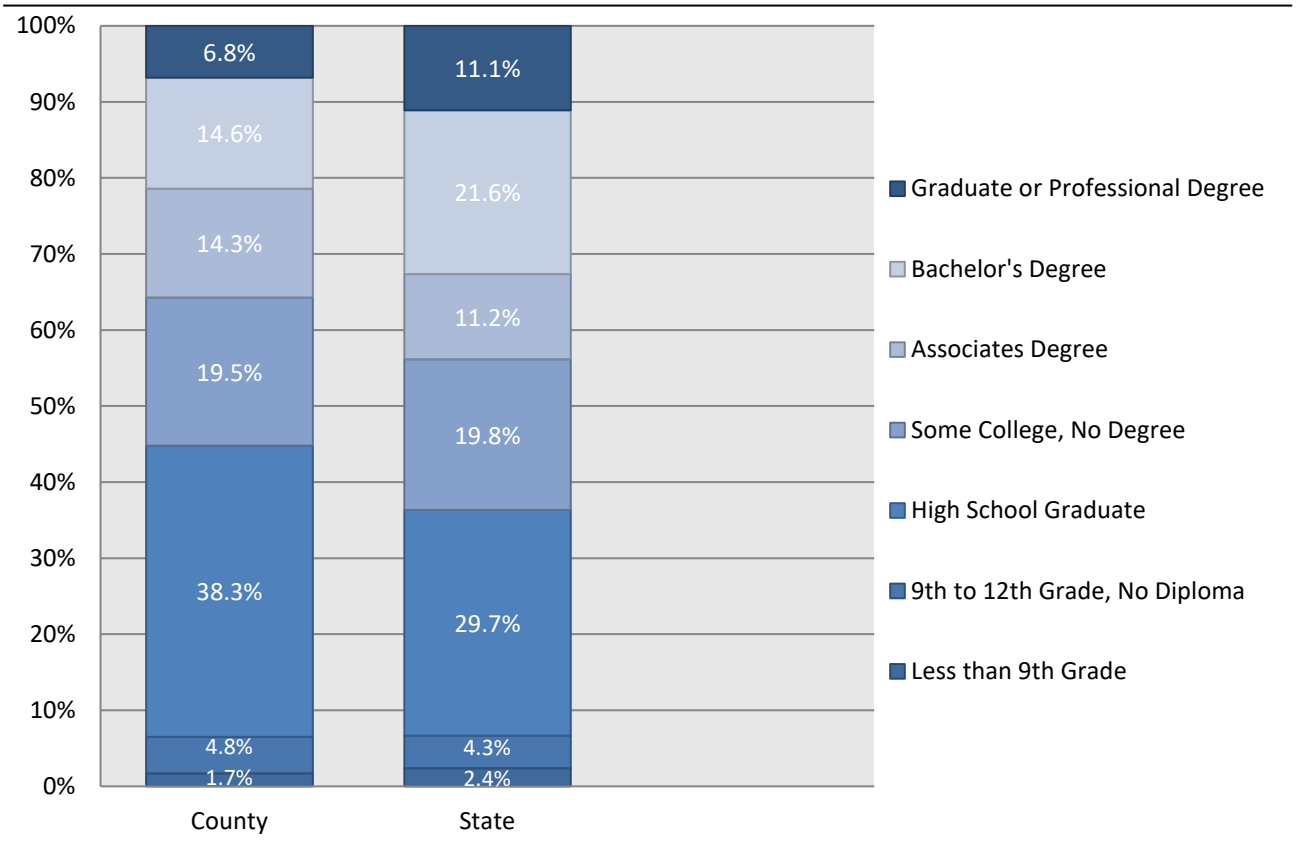


Source: 2023 American Community Survey

As of the 2023 American Community Survey, the median household income in Wood County was $66,417, and per capita income was $37,954. This is lower than the state and nation, which can be explained by the lower cost of living in Wood County. The distribution of household incomes in Wood County are fairly similar to the state, but with fewer households making $100,000 or more, and more households making less than $35,000 annually.

Educational Attainment in Wood County is generally lower than the State of Wisconsin (see **Figure 8**). About 93.5% of Wood County residents over the age of 25 have graduated high school, slightly higher than Wisconsin, where over 93.4% of residents have graduated high school. About 21.4% of Wood County have a bachelor's degree or higher, while 32.8% of Wisconsin residents have a bachelor's degree or higher. Both the proportion of residents with a bachelor's or graduate or professional degree in Wood County is lower than the state proportion. The proportion of people with an associate's degree is slightly higher in Wood County than in the state.

Figure 8: Educational Attainment, Age 25 and Older
2023



Source: 2023 American Community Survey