

Chapter 1

DEMOGRAPHIC AND RESOURCE PROFILES

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DEMOGRAPHIC AND RESOURCE PROFILES

“What is the city but the people?” - William Shakespeare, Coriolanus

What The Profiles Will Do

Cities are made of people and places. This demographic and resource profile describes characteristics of the places and people who have shaped and continue to shape Belle Plaine.

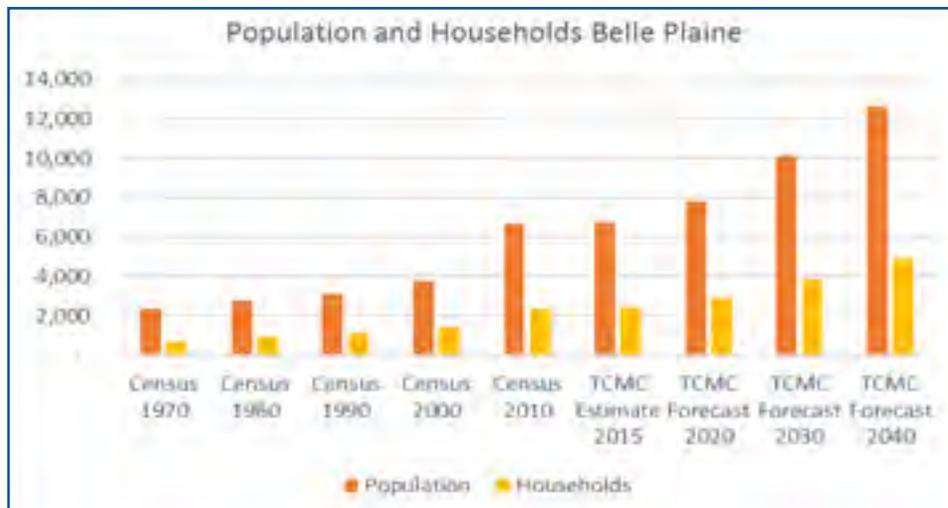
Settlers in Belle Plaine were explorers and entrepreneurs living in smaller houses with more family members in a primarily land-based economy dependent on walking or riding (horse, river, rail) to move from place to place. Since then many thousands of people have called Belle Plaine home, adjusting to new economies, new technology, and new lifestyle norms. This demographic and socio-economic profile describes our populace, the people who continue to build, shape, and make Belle Plaine.

The profile will examine historical and comparative characteristics including: population & households, age & gender, educational attainment, household type, household size, race & ethnicity, economy & employment, income & poverty, housing, and commuting.

Population and Households

Belle Plaine has been expanding in terms of population and households for decades with most rapid growth period occurring just prior to the Great Recession. Population and household growth is forecast to continue increasing through 2040. Estimates from the Metropolitan Council for 2016 place population at 6,901 and households at 2,573.

Figure 1.1



Age and Gender

A review of historical age and gender distribution comparisons confirms the demographic impact of rapid growth experienced in the late 1990's and early 2000's. The volume of persons, likely couples, living in Belle Plaine aged 30 to 45 with children increased dramatically, representative of the homogeneous type of housing created (single family owner occupied modestly priced). It will be important to monitor those aged 30-45 who moved to Belle Plaine during the housing boom to ascertain whether or not they are aging in place. If so, the City should be mindful of their changing needs, everything from park/recreation activities in their neighborhood parks to resident services.

Population by age comparison indicates a decrease in the number of persons aged 50 – 65 living in Belle Plaine relative to growth in younger population. The decrease could simply be due to a lower increase in those age groups during the period of rapid growth but is more likely representative of a lack of options for move-up and empty nester housing or a decreased sense of community, place, or cultural/recreational opportunities.

Population by age analysis reveals the volume of persons over age 80 has remained relatively stable over time presumably representative of available suitable housing arrangements.

Age cohort analysis examines a group of people as they age over time. Figure 1.6 follows age groupings over time from 1990 to 2014. Age cohort data, similar to age/gender distribution comparison data, illustrates expansion of younger families with school aged-children within the community.

Age cohort analysis also confirms empty-nesters and retirees appear to be leaving the community while housing options for more mature citizens (age 75+) are either retaining or bringing more similarly aged persons back to or into Belle Plaine.

Belle Plaine residents are increasingly earning diplomas and attending post-secondary education facilities.

Figure 1.2

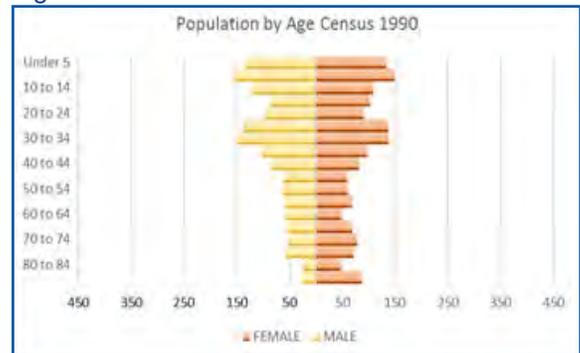


Figure 1.3

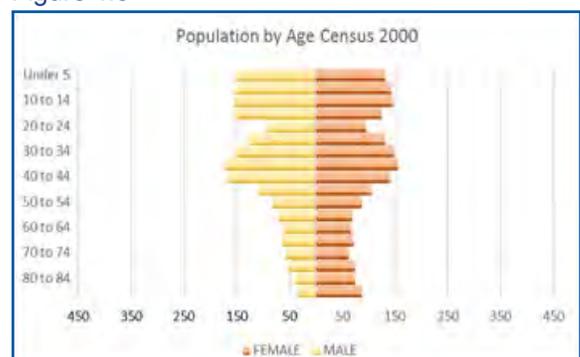


Figure 1.4

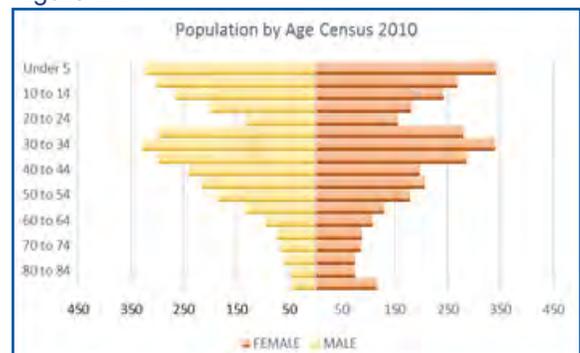


Figure 1.5

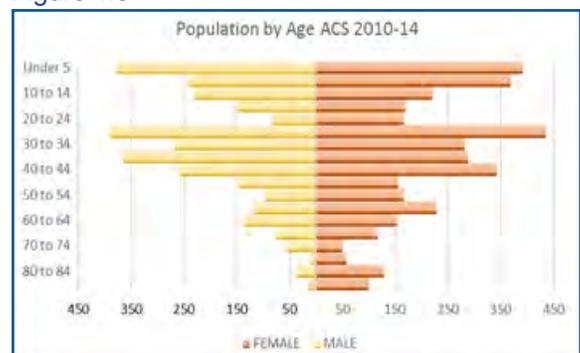
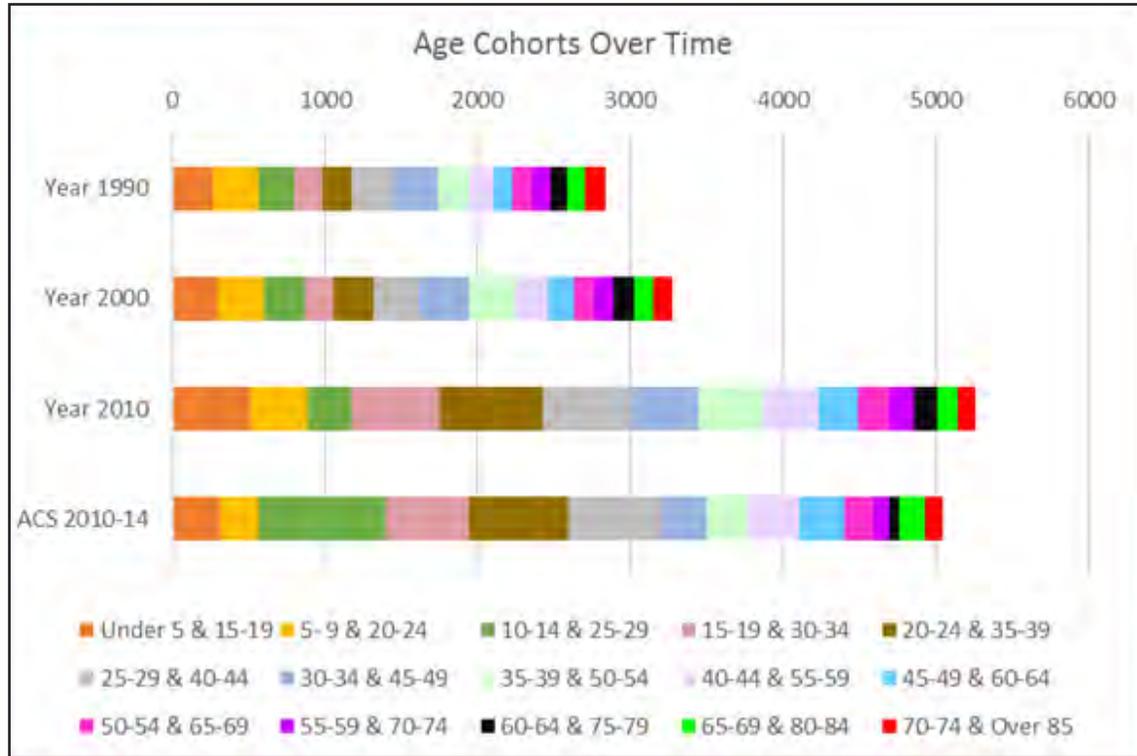


Figure 1.6

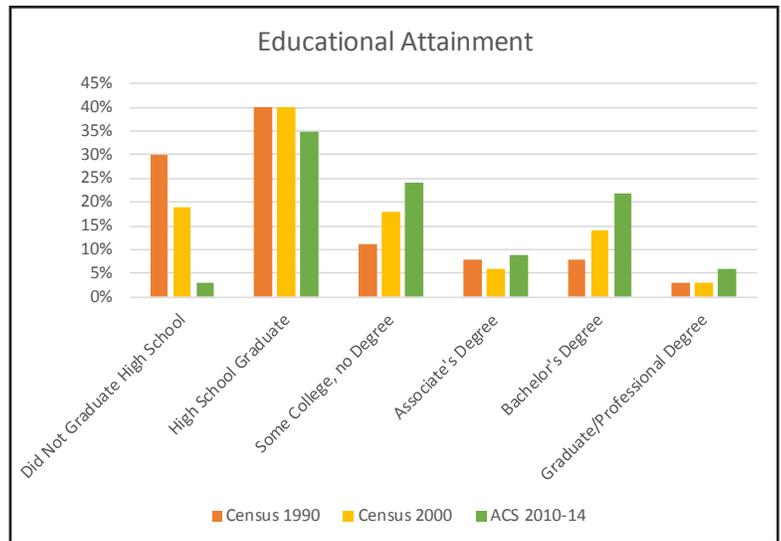


Educational Attainment

Figure 1.7 illustrates the highest level of education attained as enumerated in Census 1990, Census 2000, and estimated through the American Community Survey (average) 2010-14.

The number of residents with some college, those who earned an undergraduate degree, and those who earned a graduate/professional degree has more than doubled in each category since 1990.

Figure 1.7



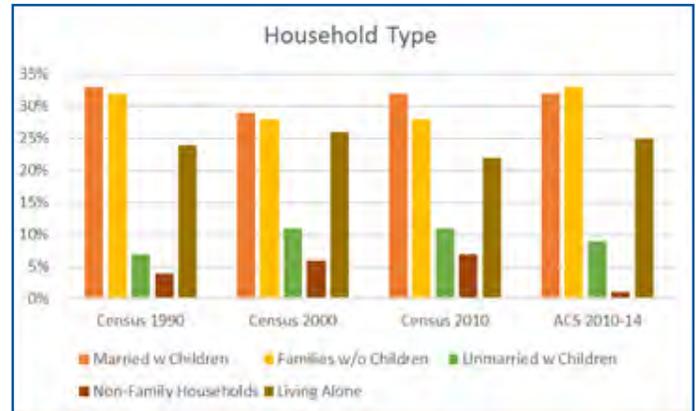
Household Type

Belle Plaine has a core of traditional family households. As illustrated in Figure 1.8 over the previous quarter century the predominate household types are families with and without children.

Non-family households, those not related by birth, marriage, or adoption are an increasingly small portion of the population. This is perhaps indicative of a lack of housing choices and/or recreational opportunities for non-family households.

The amount of people living alone decreased between 2000 and 2010 presumably because of the rapid increase in construction of single family homes rather than populations typically living alone (e.g. seniors) moving out of the City.

Figure 1.8

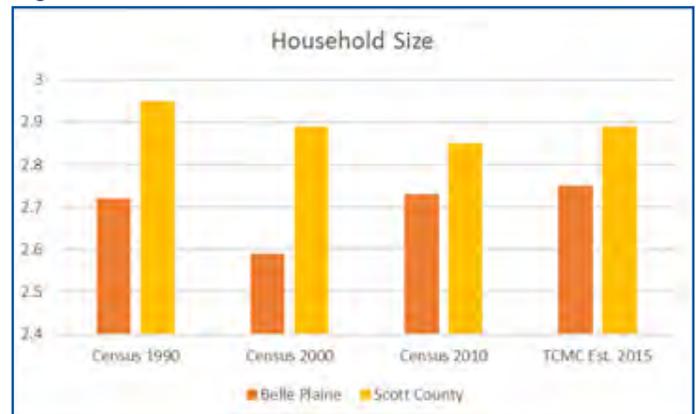


Household Size

After dipping between 1990 and 2000 household sizes in Belle Plaine have rebounded and remain relatively stable at just over 2.73 persons per household. The dip and rebound correspond to rapid growth in construction of single family owner occupied dwellings during the mid 2000's.

As expected, persons per household county wide outpace that within the City alone. The City's average household size is larger than the average within the seven-county metropolitan area (2.50) and the state average in 2015 (2.40). Household size is typically larger in owner occupied dwellings than rental units.

Figure 1.9

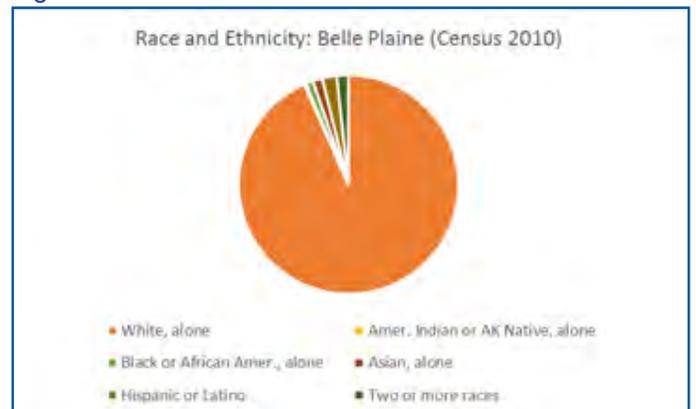


Race and Ethnicity

Compared to other areas in the Twin Cities Metro Area, the City of Belle Plaine populace is less diverse. Just seven (7) percent of Belle Plaine residents classify themselves as minority races and ethnicities.

Comparatively 86.7% of Scott County residents, 85.3% of Minnesotans, and 77.1% of all Americans consider themselves Caucasian alone.

Figure 1.10



Economy and Employment

Since 1970, the number of available jobs in the City of Belle Plaine increased decade over decade and year over year until the Great Recession hit. Recession impacts primarily hit Belle Plaine between 2010-2012, slightly delayed when compared to larger cities. Employment opportunities within the City are now rebounding after lows in 2011.

Throughout the Recession, job losses were attributed primarily to attrition rather than significant layoffs at large employers. Housing related industries including construction, real estate, and finance were especially hard hit by the Great Recession. There is a definite correlation between fewest building permits issued and low employment numbers in 2011. The slow growth in jobs could also be related to difficulties in attracting workers. A Business Retention and Expansion Study undertaken in 2014 identified deficiencies in hiring brought on by difficulty in attracting workers.

Overall, employment is projected to increase over the *Destination Belle Plaine 2040* planning period as forecast by the Metropolitan Council. The TCMC forecasts 3,300 jobs in the City by 2040.

Historically, employment opportunities in Belle Plaine have been clustered in the accommodation & food service, healthcare & social assistance, retail trade, and educational services industry sectors. Retail trade is expected to increase as the population nears 10,000 and a bump in the manufacturing sector could be anticipated if/when a northern sanitary interceptor sewer is constructed creating industrial zones with urban services.

Annual average wages in Belle Plaine continue to increase from just over \$22,000 in 2000 to over \$32,000 in 2015. Wages in Belle Plaine lag significantly behind those in the county (\$46,000) and in the seven county metropolitan area (\$57,000). Given the City's location within commuting distance to higher paying jobs it is reasonable to expect local employers paying locally competitive wages may have a difficult time attracting workers. It is furthermore reasonable to expect the City will be a 'bedroom community' with large portions of residents commuting further into metropolitan areas for work. As such retail leakage (consumers spending on goods/services outside of town) is expected to continue to be a significant challenge to local establishments. Establishing and maintaining a sense of place and community connectedness for commuters will likely also be a challenge. Sense of place and community are essential in limiting churn in single family neighborhoods and retaining residents.

Unemployment statistics are not available at the city level. Comparison of historical data from the county, state, and nation illustrate a consistent trend of lower unemployment at the county level. Unemployment levels in Scott County closely track the state average over time. Since 1990 unemployment has remained low with the exception of spikes during 2009-2011 corresponding with the Great Recession.

Figure 1.10

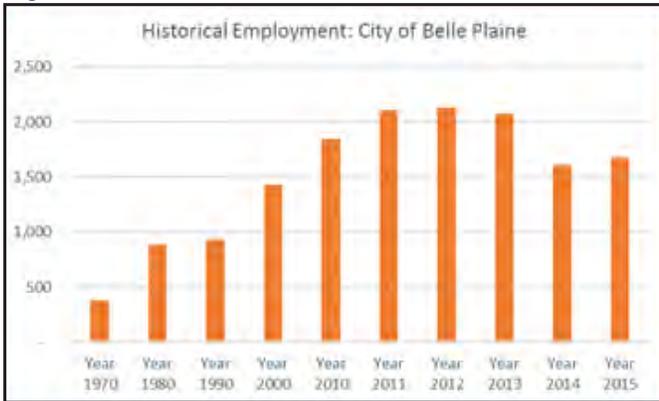


Figure 1.12

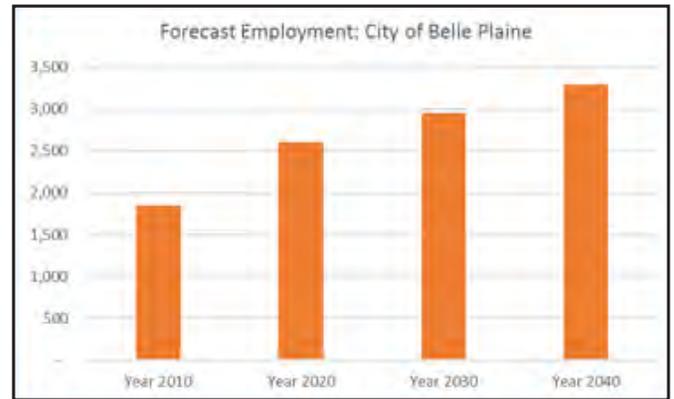


Figure 1.13

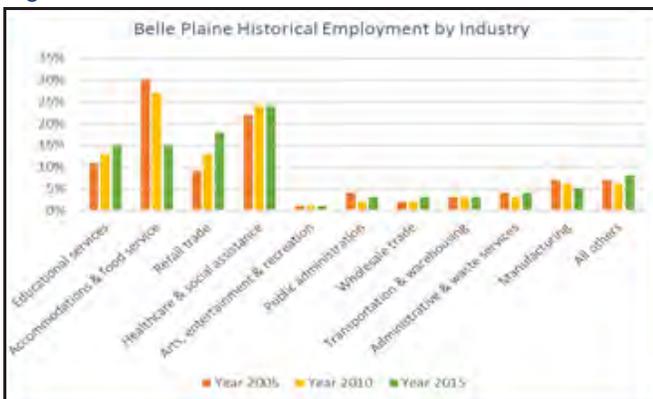


Figure 1.14

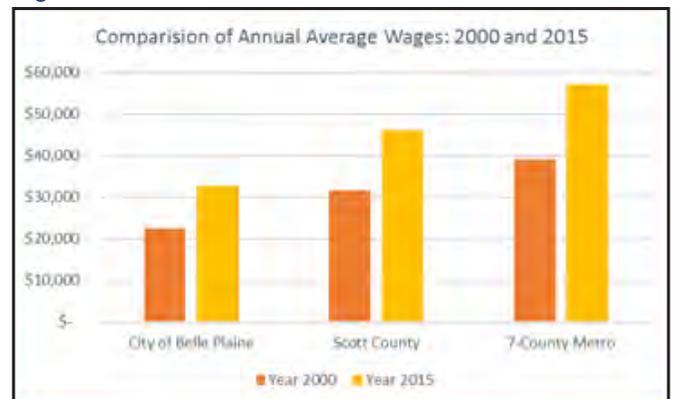
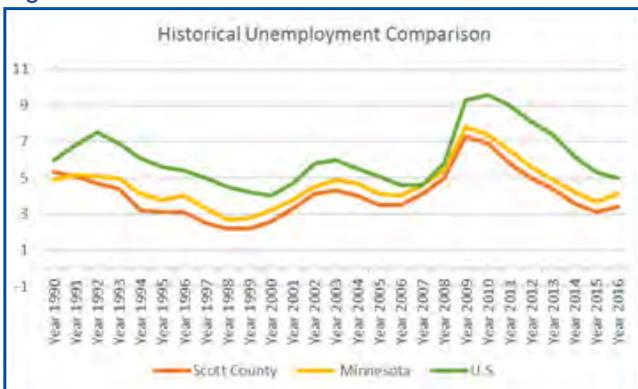


Figure 1.15



Income and Poverty

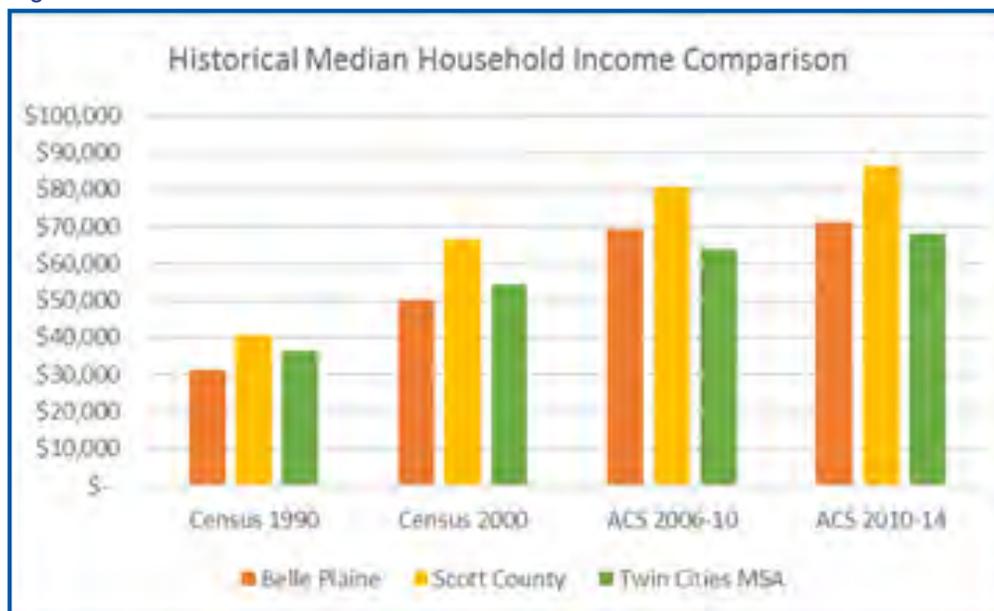
Median household and per capita income in Belle Plaine, Scott County, and the Twin Cities MSA rose dramatically from 1990 to 2010 with substantial gains evident across all three jurisdictions. Decreases in earnings resulting from the housing crisis and Great Recession are similarly evident across jurisdictions with measured gains beginning in the past few years.

Belle Plaine has outpaced the metro area in terms of growth in household income since 2000, rising at a similar rate to that of Scott County. The same is not true of per capita income with both the county and metro area averages eclipsing the City's per capita income average. City per capita income also appears to be slower to rebound from the Great Recession, a common happening in rural areas including rural growth centers.

Figure 1.17



Figure 1.16



Several Belle Plaine residents are living at or near the poverty level. In 2015 poverty level for an individual was \$11,770, for two persons \$15,930, and for a family of four \$24,250. After a dip in the early 2000's the percentage of persons living at or below 150% of the poverty level has been increasing slightly.

Although persons living at/below the poverty level are present in all age groups, the final chart on this page illustrates the degree of low and moderate income persons over aged 75 and under age 18. The data suggests programs may be most needed by families with young children (single head of household) and by the most aged.

Figure 1.18

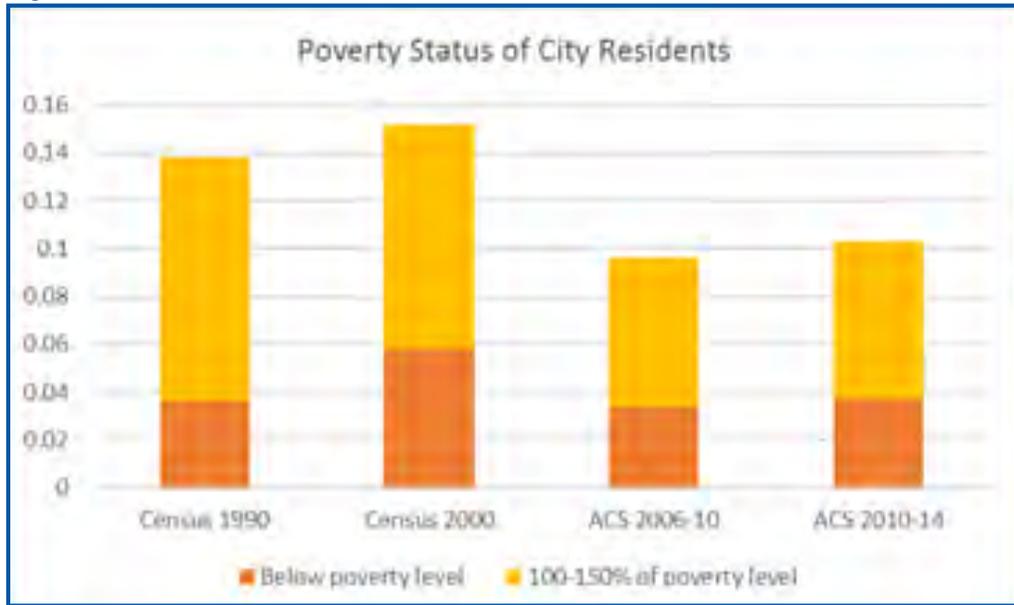
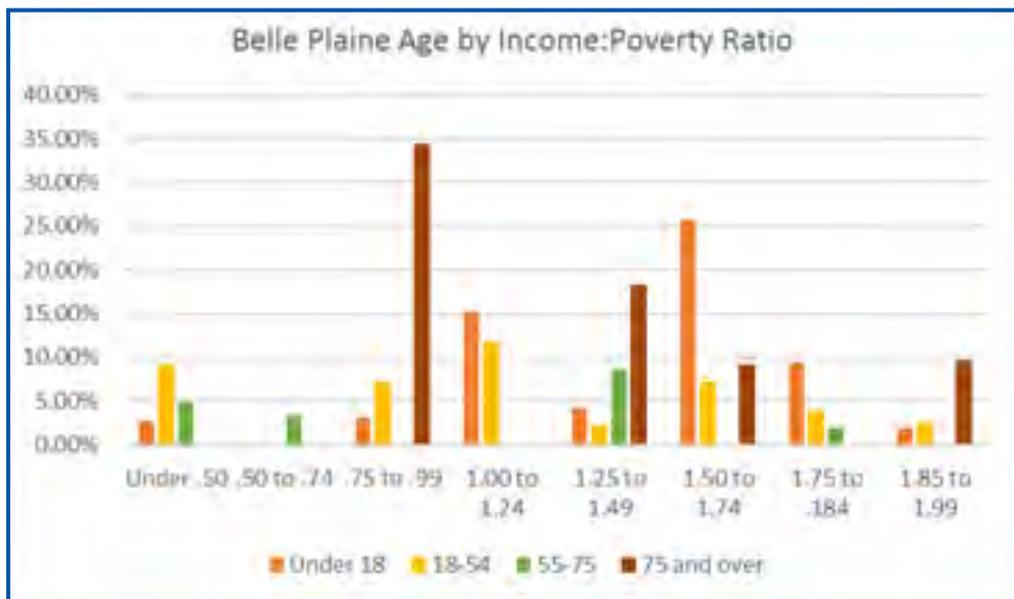


Figure 1.19



Housing

A total of 85% of the housing stock in Belle Plaine consists of single family detached (78%) and attached (7%) dwelling units. Eight percent of the housing stock consists of apartment units in structures of five or more units. Manufactured homes and duplex/triplex/quads round out the City's available housing stock.

Housing construction peaked in Belle Plaine in the early 2000's with the construction consisting primarily of detached single family dwelling units. Following the Great Recession new home construction has been returning at a very measured pace but trending in a positive direction. Multiple family dwelling units added in 2007 correspond to the construction of The Lutheran Home Association's Kingsway housing development.

Although housing in Belle Plaine is generally more affordable than that in other communities in Scott County, few affordable housing units have been constructed over the previous two decades. A total of seven percent of all dwelling units created between 2003 and 2014 were considered affordable. Of the 578 owner occupied dwellings created during the same time, 38 (7%) were affordable. Of the 85 rental dwelling units created from '03 to '14 only four (5%) were affordable. "Affordable" is defined by applying a 30% of income rule of thumb for monthly housing expenses. For example, a family with a monthly income of \$3,000 should spend no more than \$1,000 per month for housing. The 30% rule when applied to households earning less than 80% of area median income and scaled for number of persons in the household equates numerically to what may or may not be affordable.

Since 1990 the mix of owner occupied to rental dwellings has shifted to a higher percentage of owner occupied to rental units. In 1990 a 77/23% owner occupied to renter occupied units existed. In 2014 that mix is 85/15% in favor of owner occupied units. Generally, a 70%/30% owner occupied to renter occupied mix is considered a healthy mix of dwelling units.

Dwelling unit vacancy rates have fluctuated over time, lowest in the year 2000 and highest from 2010-2014, parallel to the peaking of the housing recession locally. The spike in vacancy rates has leveled off since 2014 with a corresponding bump in new housing starts confirming an up-tick in demand for housing.

Home ownership has long been viewed as a gateway to the middle class and an effective means of building wealth. Several studies illustrate a correlation between home ownership and social benefits such as increased educational attainment, increased civic participation, and less churn in community members i.e. renters are often younger and move more frequently for employment and personal reasons. Since 1990 home ownership rates in Belle Plaine have increased. Over the previous 25 years, increases in home ownership rates locally have outpaced that in both Scott County and the seven-county Twin Cities metro.

Median housing values have increased remarkably, from \$69,000 in 1990 to nearly \$200,000 in 2010. Deflation of real estate values, a hallmark of the Great Recession, has ceased and home values are on the rise. Since 1990 the value of homes in Belle Plaine compared to homes in Scott County and the Twin Cities Metro has remained relatively constant with median home values in both the county and the metro exceeding that in Belle Plaine.

Median rents have also increased remarkably, from \$362 in 1990 to \$696 in 2014. Unlike housing values, median rents actually increased during the Great Recession as rental demand increased sharply. Median rent in Belle Plaine are significantly less than those in Scott County and the Twin Cities metro. Median rent in Scott County outpaces that of the metro.

Examination of historic data relating to housing sales by value indicates housing prices and the volume of sales have rebounded from the depths of the recession. Activity in 2014 and 2015 based on certificates of real estate values denotes a bustling market for home sales, especially those in the \$150,000 to \$175,000 range.

Figure 1.19

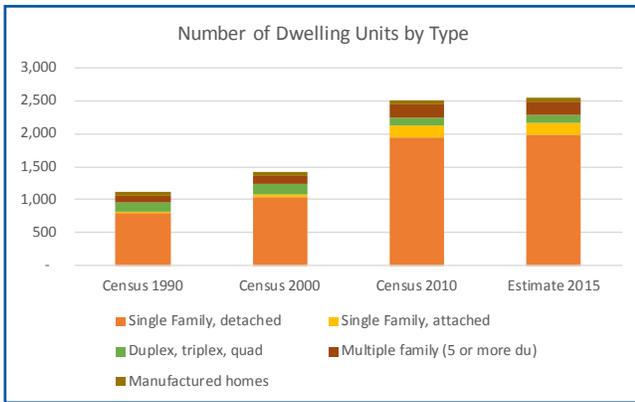


Figure 1.19

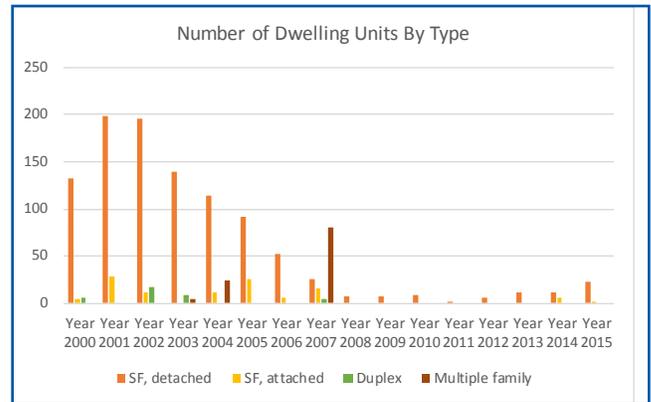


Figure 1.20

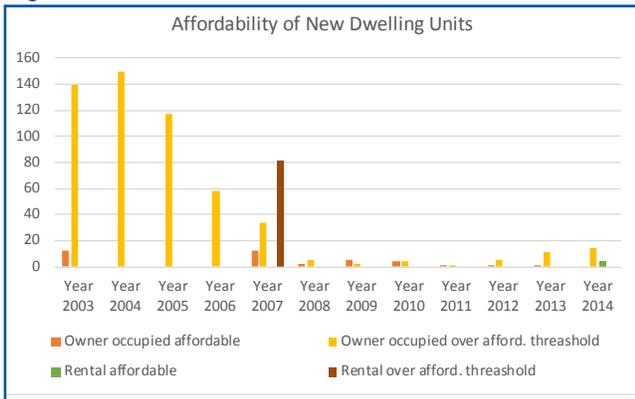


Figure 1.21

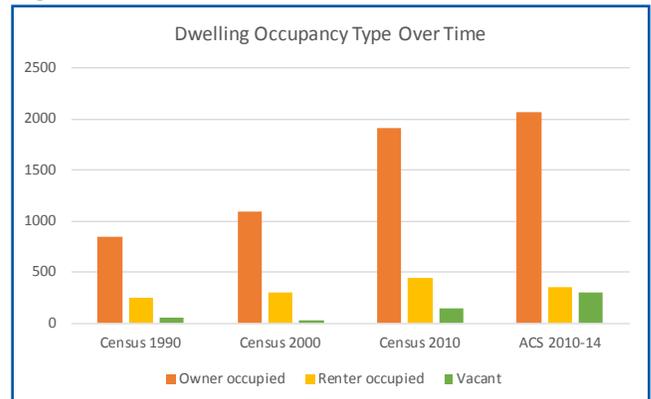


Figure 1.22

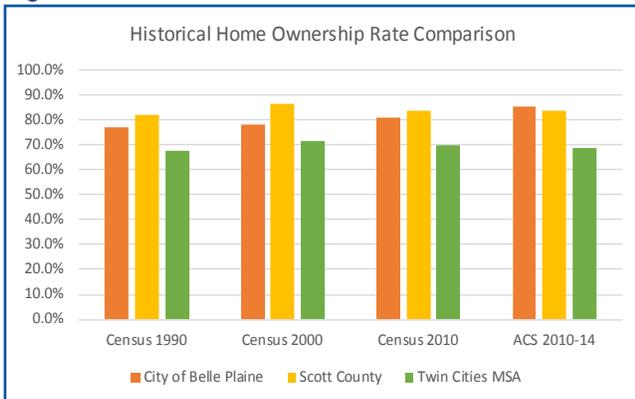


Figure 1.23



Figure 1.24

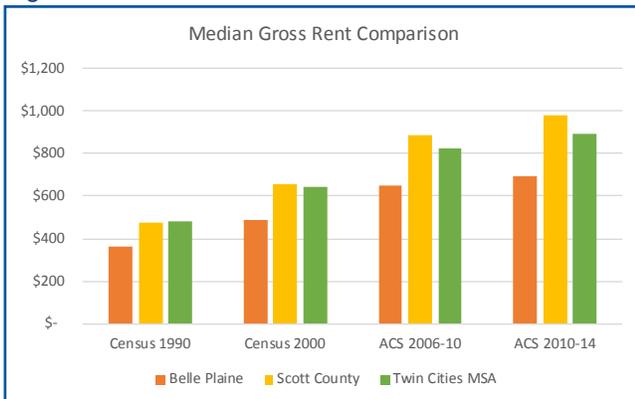
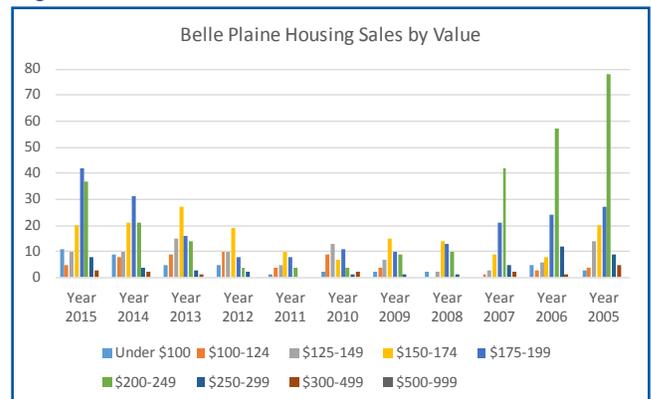


Figure 1.25



Commuting

The Great Recession also influenced commuting patterns. While the majority of workers living in Belle Plaine have historically chosen to drive alone to work, carpooling briefly increased during the height of the Recession. In addition, an up-tick in the amount of residents working from home is noted post-recession.

Overall and over time, Belle Plaine residents are spending more and more time traveling to/from work. In 1990 a third of residents had a less than ten-minute commute to work and another third traveled more than 30 minutes to work. In 2014, only 15% of residents have a less than ten-minute commute, a full 53% travel more than 30 minutes to work.

Belle Plaine residents travel to a variety of destinations for work (commute shed). Most common work-destinations for residents are: within the City and to the cities of Shakopee, Chaska, and Eden Prairie. The commute shed has remained relatively constant over time.

Residents who live in Belle Plaine are most likely to work in Belle Plaine, Le Sueur County, Belle Plaine Township, and Sibley County. Where Belle Plaine workers live is termed 'labor shed'.

Figure 1.28

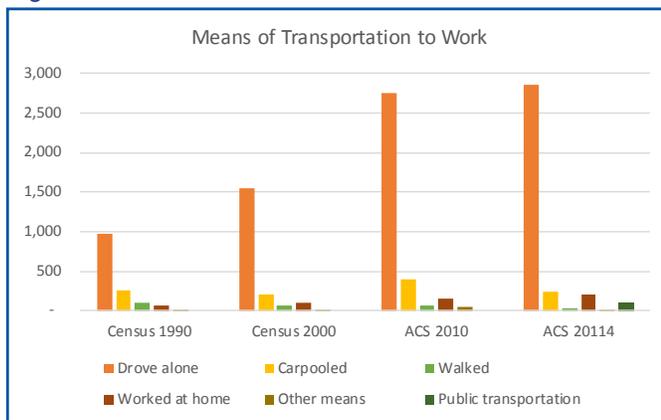


Figure 1.29

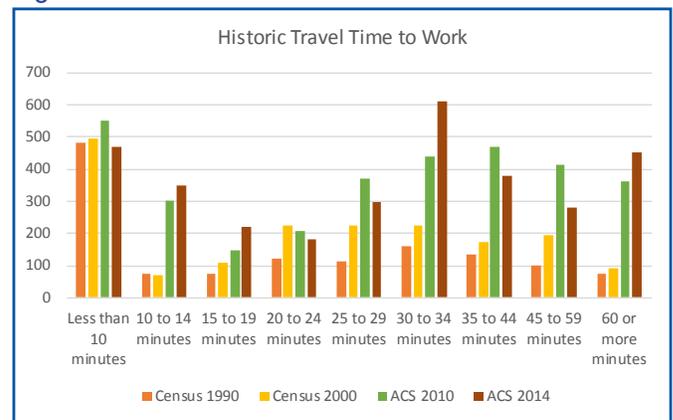


Figure 1.30

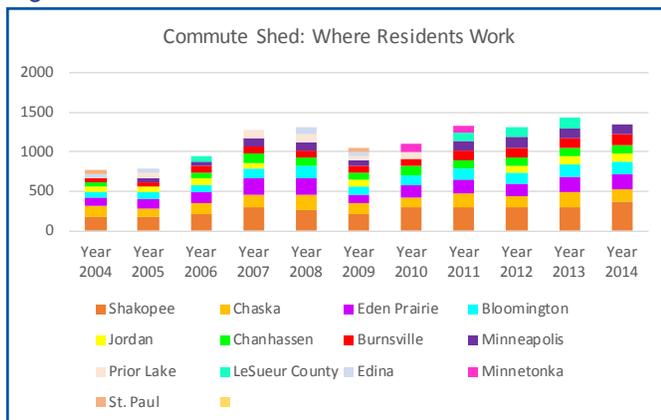
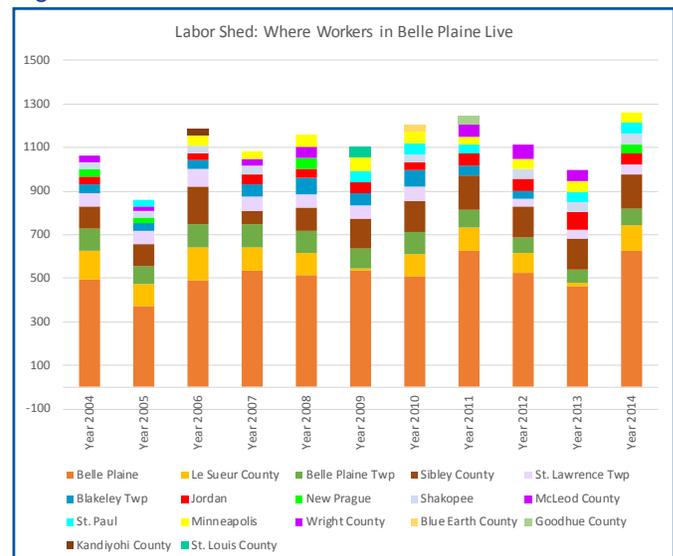


Figure 1.31



Resource Profile

“Nature is not a place to visit. It is home”. – Gary Snyder

What The Profile Will Do

Cities are made of people and places. This resource profile describes characteristics of place which shaped and continue to shape Belle Plaine. Land and water resources including the Minnesota River, rich agricultural soils, and woodlands teeming with wildlife attracted settlers to Belle Plaine. Over time wooded ravines, floodplains, and steep slopes were interwoven in the urban landscape existing today primarily within park, open space, and residential uses. The same resources continue to provide important functions and services from stormwater conveyance to higher property values within desirable neighborhoods.

Cultural resources are evidence of past human activity and include prehistoric and historic sites, structures, and artifacts or objects either known or undiscovered. Cultural resources are nonrenewable resources providing unique information about the past and potential answers for modern problems.

Sites of community significance are local places and resources that are important and noteworthy. Balanced and collective recognition of, respect for, and preservation of sites of community significance further *Destination Belle Plaine 2040*'s sought after results: stewardship, livability, sustainability, economic prosperity, and social equity.

This resource profile describes existing or potential land, water, and cultural resources culminating in identification of sites with community significance.

What Drives This Element

We recognize land, water, and air are finite resources upon which all forms of life and our quality of life depend. We are certain “we” (the community) are the managers of that which our ancestors entrusted to us. As good stewards “we” (the collective community) are the protectors of that which future generations will inherit. As individuals we are each expected to be good stewards of our finite resources.

We accept as true that choices made today are consequential and may permanently impact choices and actions available to future generations. To those ends, we are committed to meeting the needs of today without compromising the ability of future generations to meet their own needs.

We strive to ensure every resident, employee, and business of the City has access to resources, opportunities, and outcomes provided by healthy land, water, and air.

Land Resources

Belle Plaine's 6.5 square mile footprint corresponds to geologic and terrain features unique in type, area, and location. Bedrock and soil types, steep slopes, bluffs, land cover alterations, and aggregate deposits have shaped and directed the physical development of the City. Land resources are finite and non-renewable. Future growth and redevelopment which respects, preserves, protects, and, to the extent possible restores the uniqueness of land resources begins with awareness of and appreciate for said resources. To those ends the following inventory of land resources is provided.

Map 1-1 Physical Profile

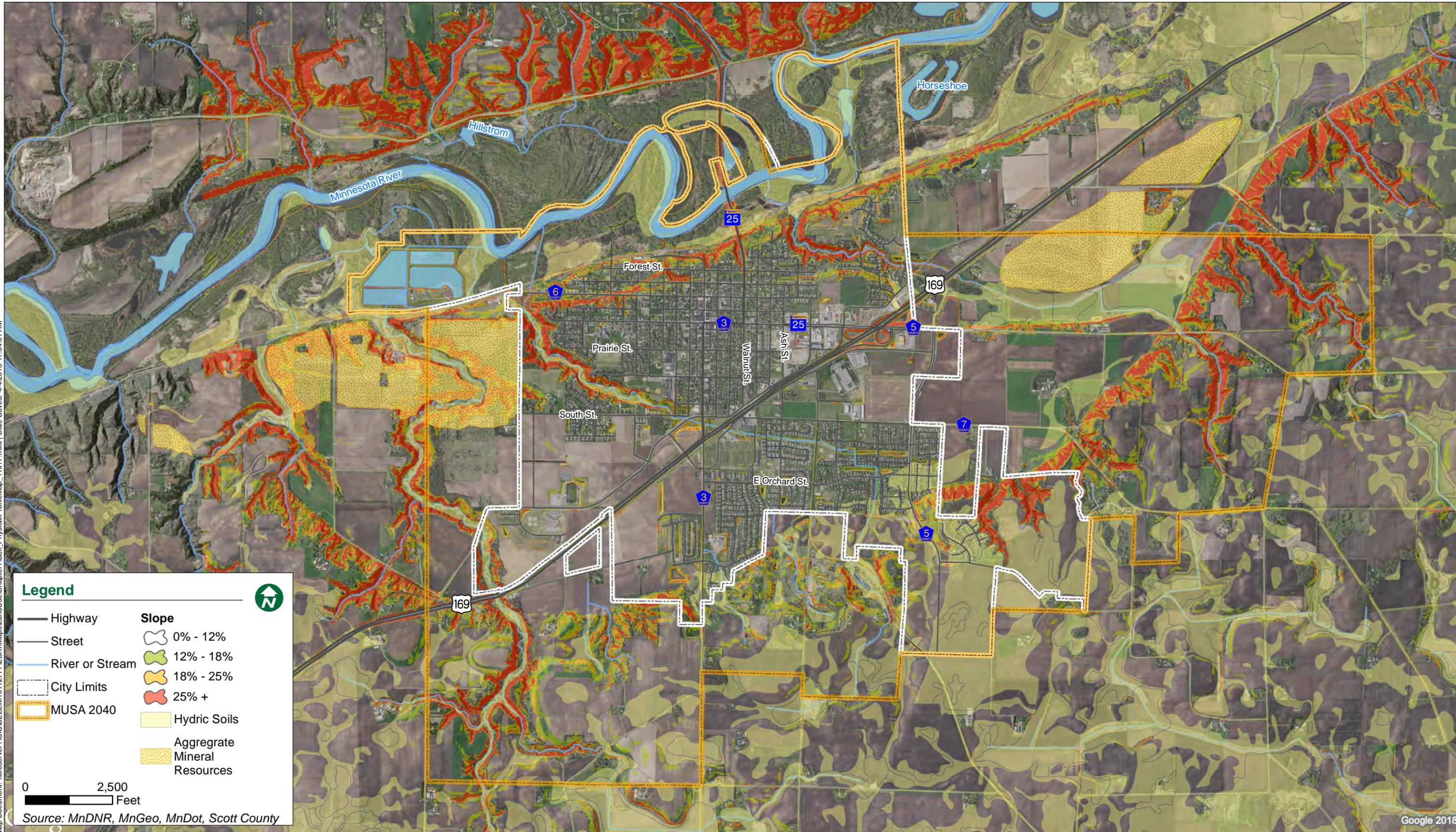
Map 1-2 Natural Resources

Map 1-3 Belle Plaine Habitat

Map 1-4 Land Cover (MLCCS)

Map 1-5 Land Cover (NLCD)

Map 1-6 Blufflands



Legend

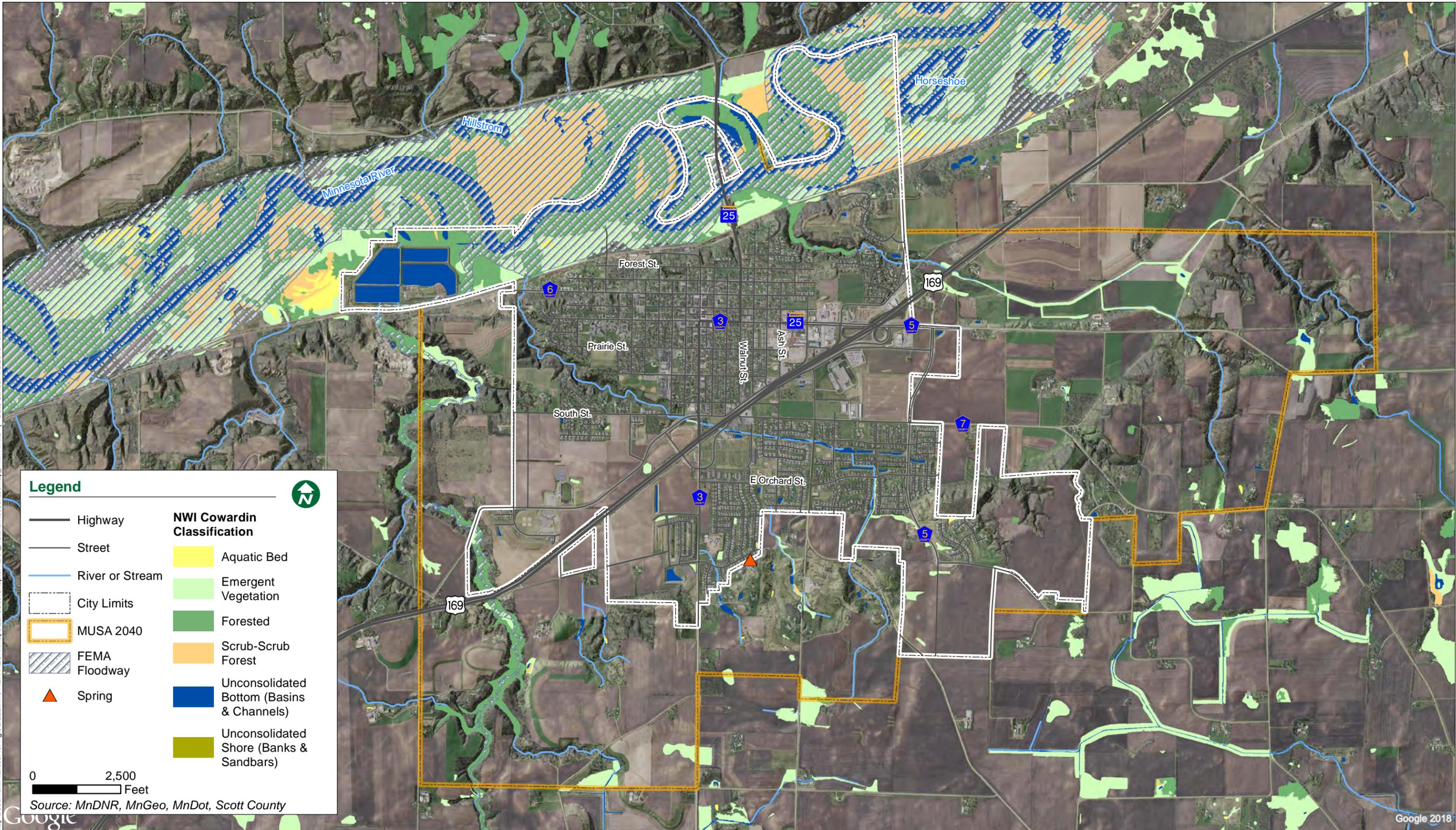
- Highway
 - Street
 - River or Stream
 - City Limits
 - MUSA 2040
- | | |
|--------------|-----------------------------|
| Slope | 0% - 12% |
| | 12% - 18% |
| | 18% - 25% |
| | 25% + |
| | Hydric Soils |
| | Aggregate Mineral Resources |



0 2,500 Feet

Source: MnDNR, MnGeo, MnDot, Scott County

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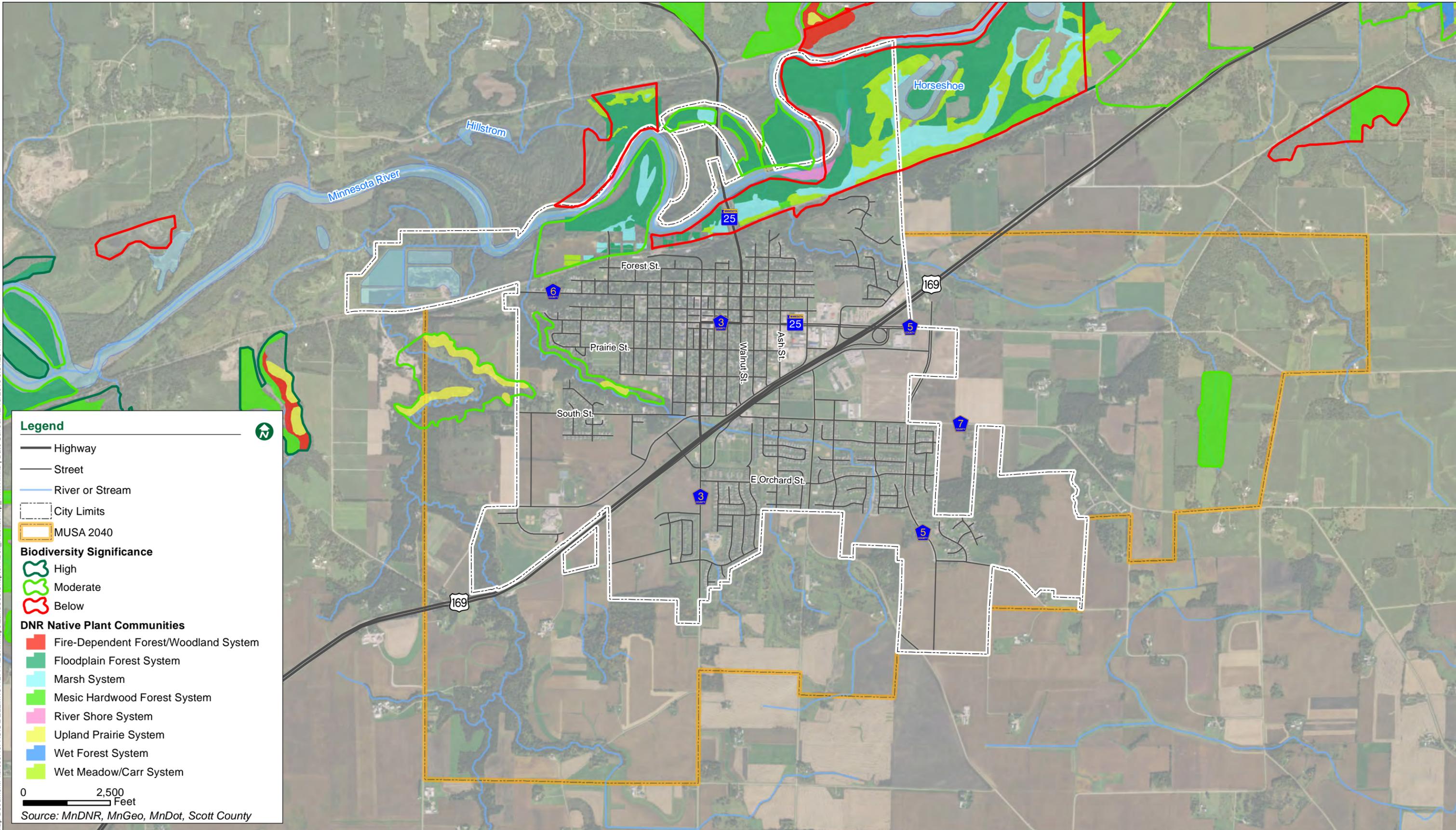
- | | | | |
|--|-----------------|--|-------------------------------------------|
| | Highway | | Aquatic Bed |
| | Street | | Emergent Vegetation |
| | River or Stream | | Forested |
| | City Limits | | Scrub-Scrub Forest |
| | MUSA 2040 | | Unconsolidated Bottom (Basins & Channels) |
| | FEMA Floodway | | Unconsolidated Shore (Banks & Sandbars) |
| | Spring | | |



0 2,500 Feet

Source: MnDNR, MnGeo, MnDot, Scott County

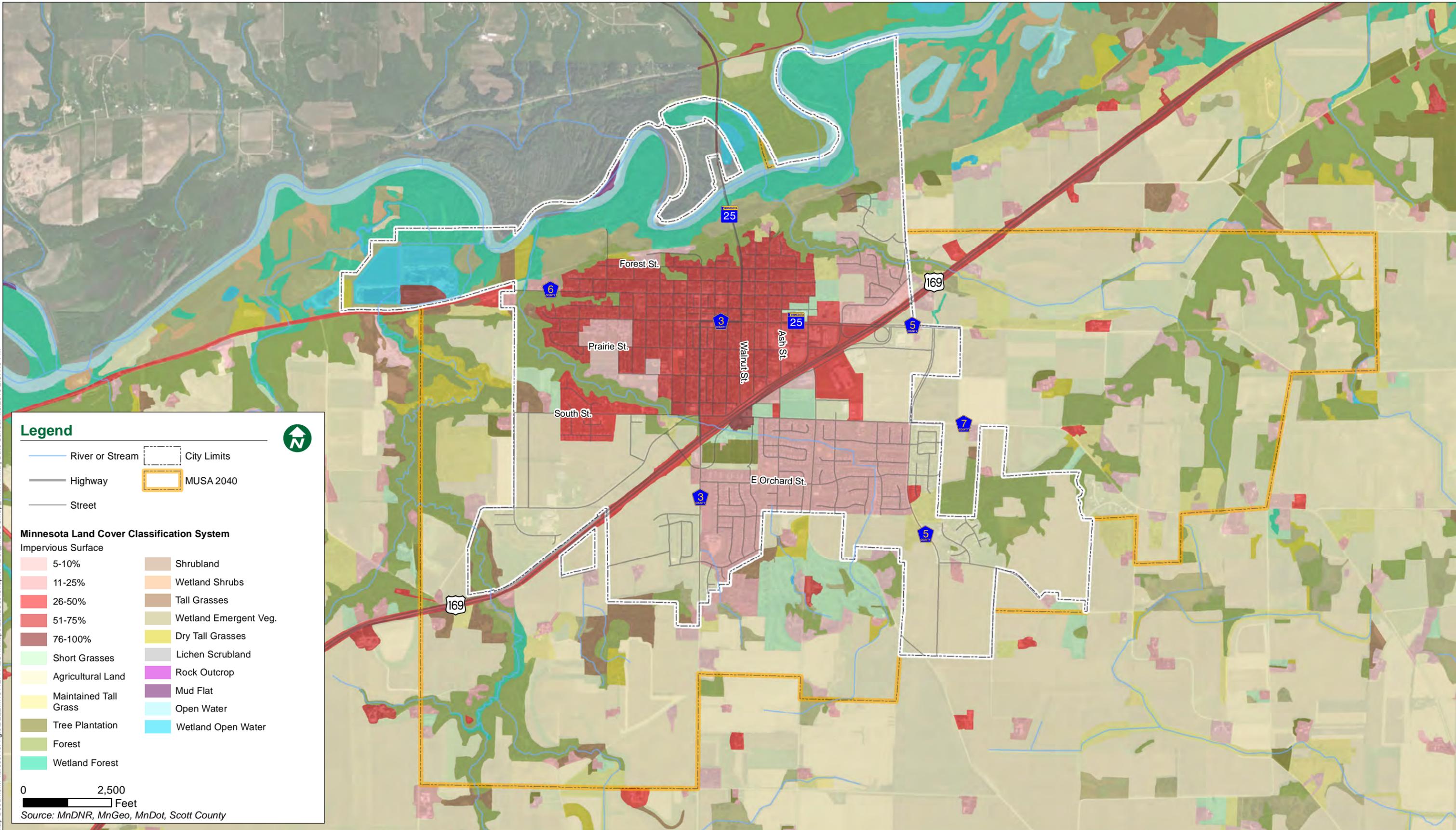
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- Legend**
- Highway
 - Street
 - River or Stream
 - - - City Limits
 - ▭ MUSA 2040
- Biodiversity Significance**
- High
 - Moderate
 - Below
- DNR Native Plant Communities**
- Fire-Dependent Forest/Woodland System
 - Floodplain Forest System
 - Marsh System
 - Mesic Hardwood Forest System
 - River Shore System
 - Upland Prairie System
 - Wet Forest System
 - Wet Meadow/Carr System

0 2,500 Feet
Source: MnDNR, MnGeo, MnDot, Scott County

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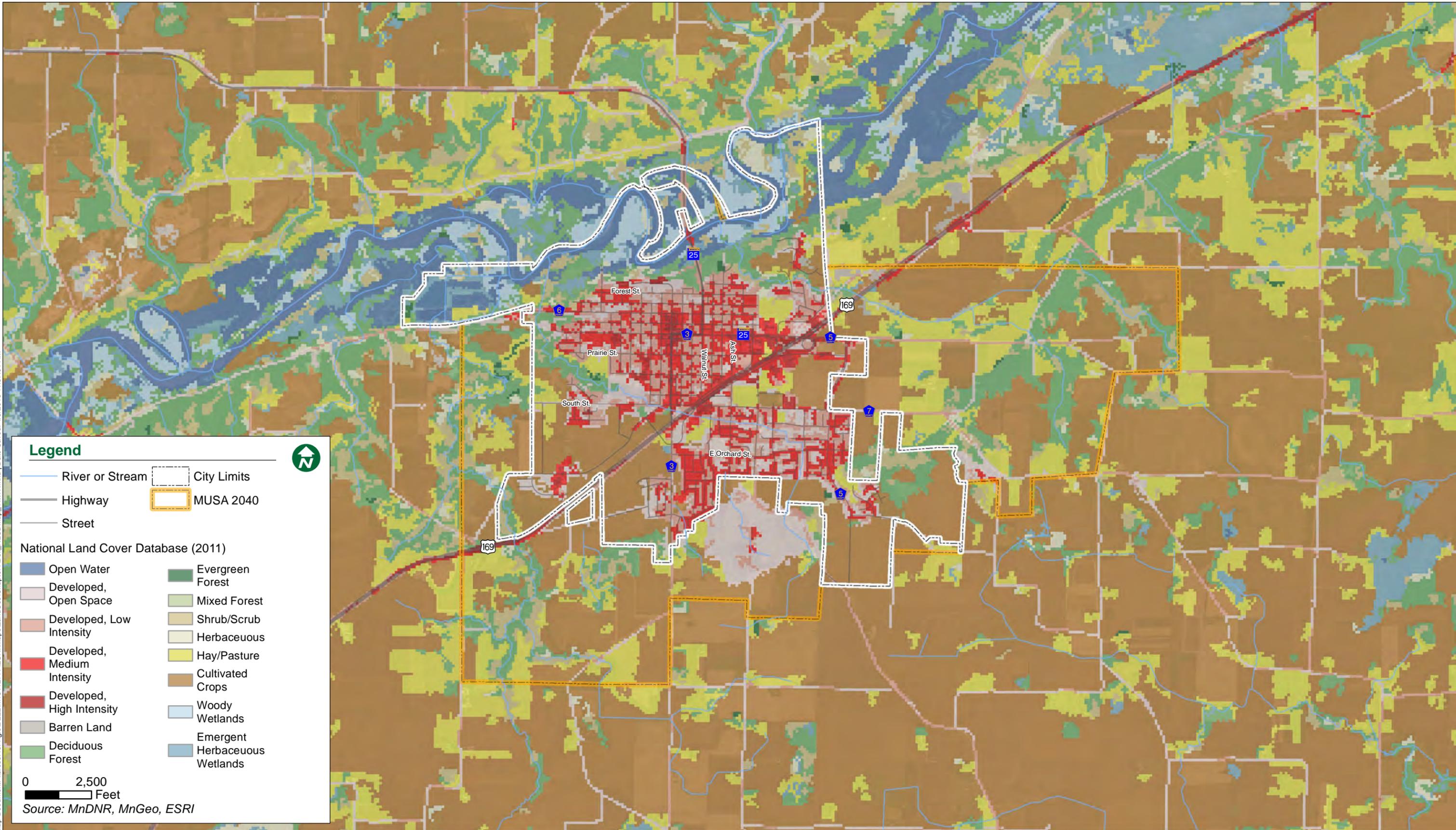
- River or Stream
- Highway
- Street
- City Limits
- MUSA 2040

Minnesota Land Cover Classification System

5-10% Impervious Surface	Shrubland
11-25% Impervious Surface	Wetland Shrubs
26-50% Impervious Surface	Tall Grasses
51-75% Impervious Surface	Wetland Emergent Veg.
76-100% Impervious Surface	Dry Tall Grasses
Short Grasses	Lichen Scrubland
Agricultural Land	Rock Outcrop
Maintained Tall Grass	Mud Flat
Tree Plantation	Open Water
Forest	Wetland Open Water
Wetland Forest	

0 2,500
Feet

Source: MnDNR, MnGeo, MnDot, Scott County



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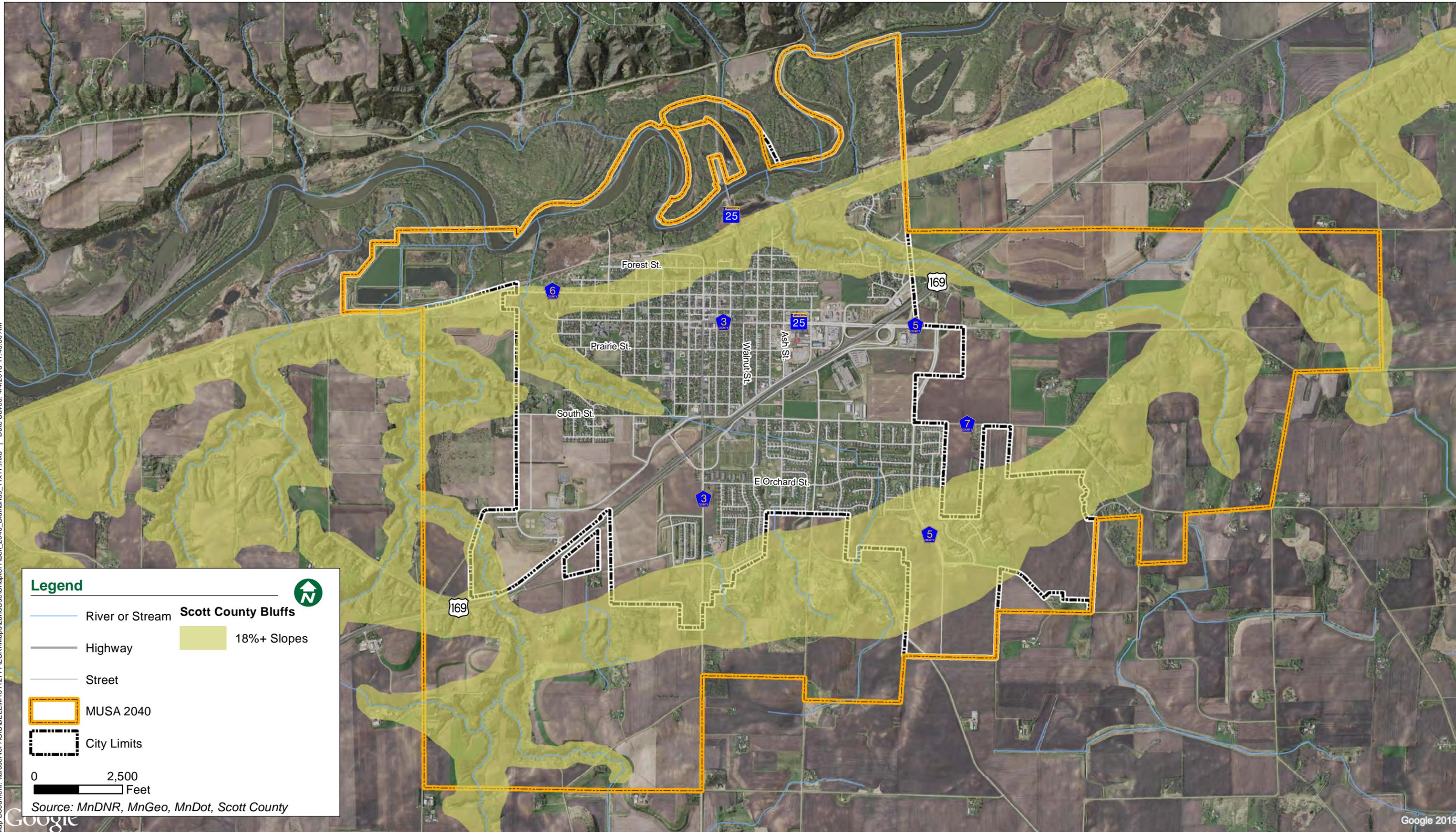
Legend

- River or Stream
- Highway
- Street
- City Limits
- MUSA 2040

National Land Cover Database (2011)

Open Water	Evergreen Forest
Developed, Open Space	Mixed Forest
Developed, Low Intensity	Shrub/Scrub
Developed, Medium Intensity	Herbaceous
Developed, High Intensity	Hay/Pasture
Barren Land	Cultivated Crops
Deciduous Forest	Woody Wetlands
	Emergent Herbaceous Wetlands

0 2,500 Feet
Source: MnDNR, MnGeo, ESRI



Legend

- River or Stream
- Highway
- Street
- MUSA 2040
- City Limits
- Scott County Bluffs
- 18%+ Slopes

0 2,500 Feet

Source: MnDNR, MnGeo, MnDot, Scott County

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Cultural Resources

Cultural resources including landscapes, buildings, and historic/prehistoric objects and artifacts provide the basis for understanding and learning from our human past. Cultural resources are non-renewable and may be known or not yet discovered. Appreciation for cultural resources helps us define who we are, how we arrived here, and from where we came. Future growth and redevelopment which respects, preserves, protects, and to the extent possible restores cultural resources begins with awareness of and appreciation for said resources. To those ends, the following inventory of cultural resources is provided.

Historic Sites

There are two properties within the City of Belle Plaine listed on the National Register of Historic Places: The Episcopal Church of the Transfiguration and the Hooper Bowler Hillstrom House. The Episcopal Church, located at Walnut and Church Streets, was constructed in 1869 and listed on the Register April 17, 1980. The Hooper Bowler Hillstrom House, located at Court and Cedar Streets was constructed in 1871 and listed in the Registry on April 17, 1970.

The City acknowledges that although the Church and Hillstrom House are listed on the National Register, they may subject to unintended loss of historic integrity due to alteration or delayed maintenance. As such the City has included both properties in adjacent public parks and budgets for operation/maintenance through both historic properties and parks line items.

The City further acknowledges that there are other architecturally interesting structures, culturally important locales (locally), and physical landscapes (prairies) that while not listed or eligible for the National Register are potentially defining points of Belle Plaine's history. As such the City continues to discuss and examine methods to keep such structures and places available for reminders to future generations of Belle Plaine's history.

Map 1-7 Cultural Profile

Water Resources

Water is an essential natural resource that shapes landscapes, is critical to ecosystem function, and provides for human well-being. Ground water, surface water, water use, water quality, and water quantity have shaped and directed the physical development of the City. Water is a finite, vulnerable, and location-specific resource. Future growth and redevelopment which respects, preserves, protects, and, to the extent possible, restores water resources begins with awareness of and appreciation for said resources. To those ends, the following inventory of water resources is provided.

Map 1-8 Water Resource

Map 1-9 Groundwater Drinking and Sensitivity Water Supply Management Area

Map 1-10 Floodplains and Shorelands

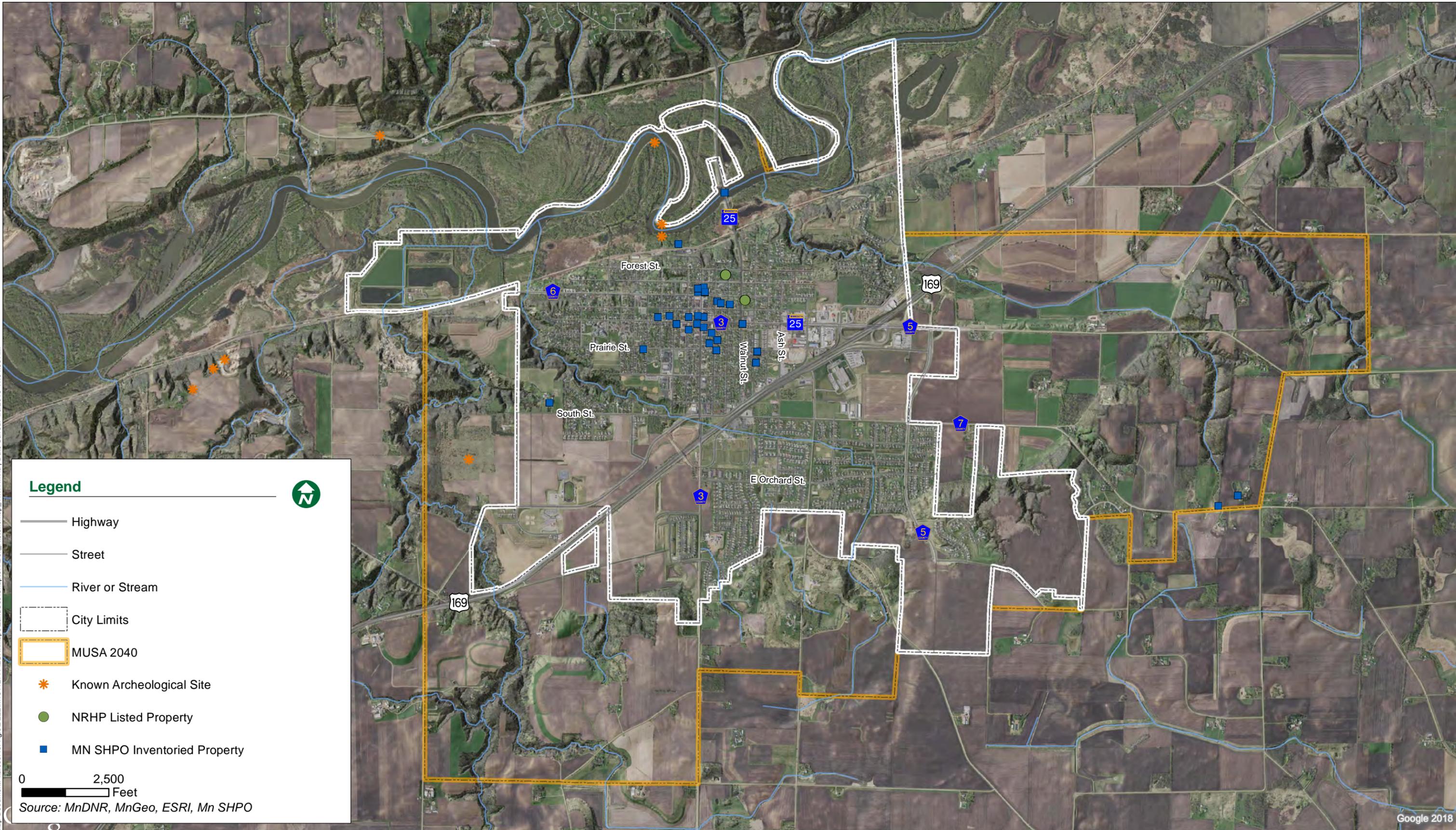
Areas of Community Significance: Land, Water, and Cultural Resources

Map 1-11 is a compilation of several datasets and illustrates in a comprehensive manner areas of potential community significance. Map 1-12 layers planned future land use with areas of community significance.

Map 1-11 Areas of Community Significance

Map 1-12 Areas of Community Significances with Future Land Use

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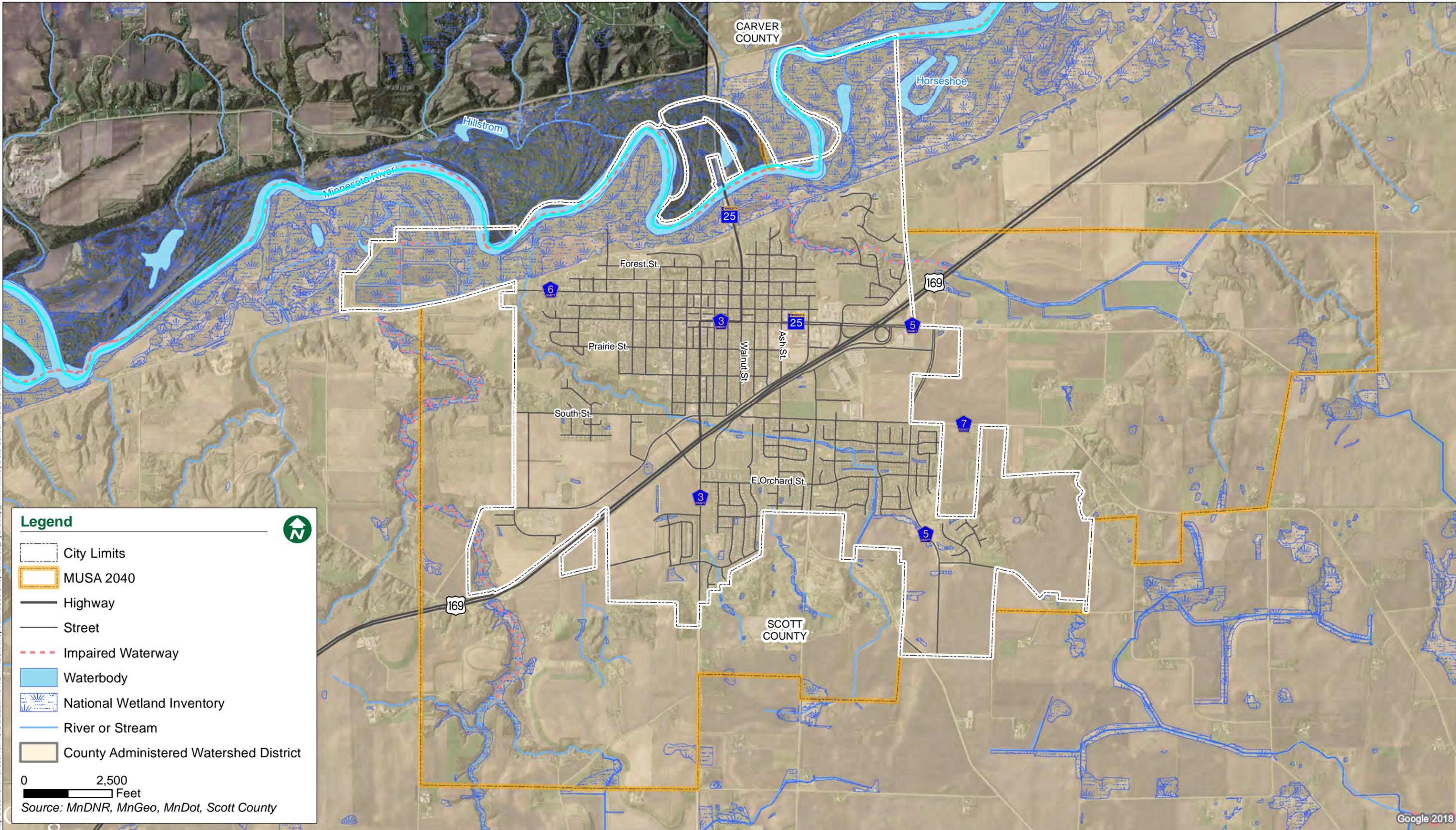


Legend

- Highway
- Street
- River or Stream
- City Limits
- MUSA 2040
- Known Archeological Site
- NRHP Listed Property
- MN SHPO Inventoried Property

0 2,500 Feet

Source: MnDNR, MnGeo, ESRI, Mn SHPO



Legend

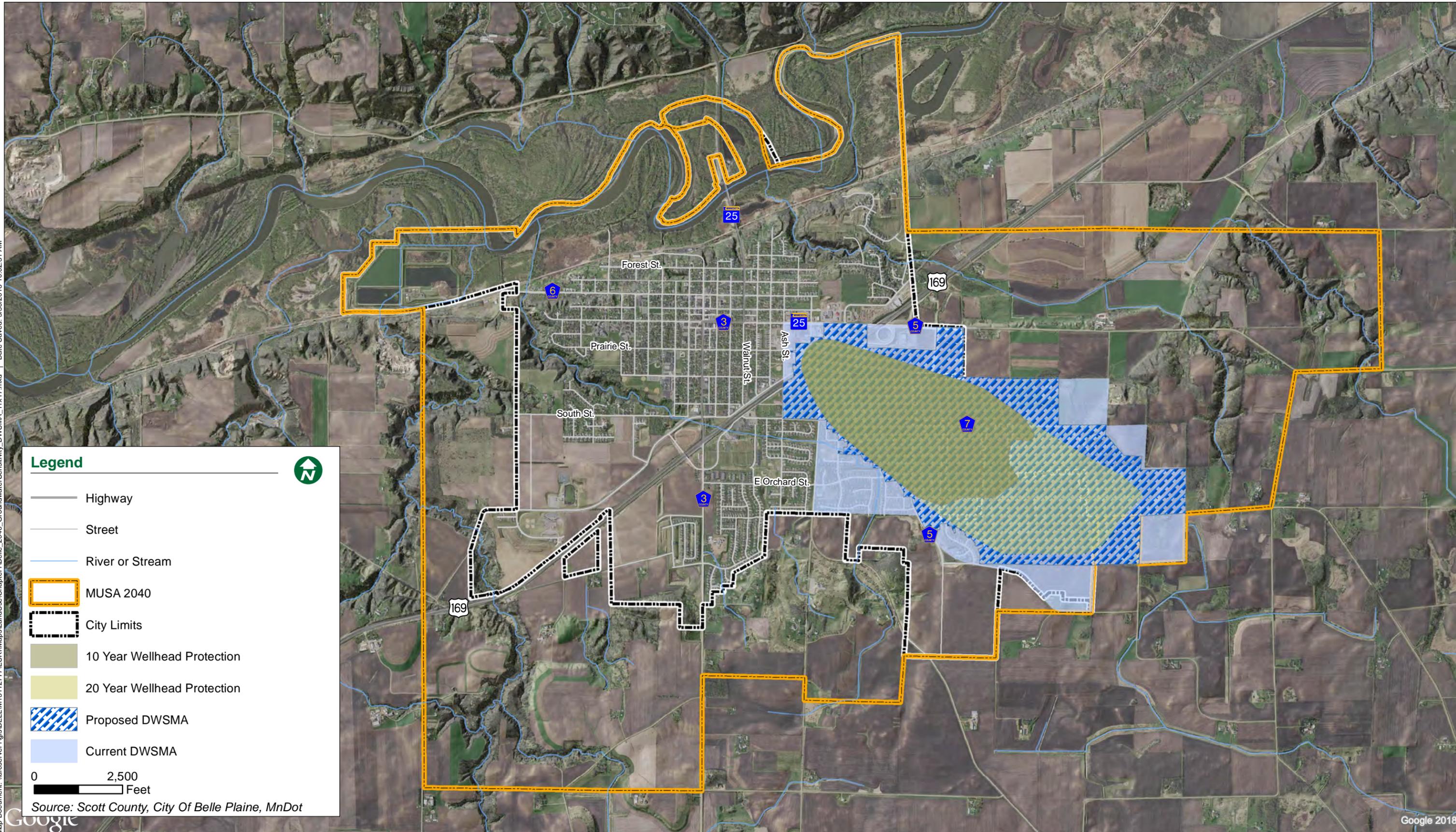
- City Limits
- MUSA 2040
- Highway
- Street
- Impaired Waterway
- Waterbody
- National Wetland Inventory
- River or Stream
- County Administered Watershed District



0 2,500
Feet

Source: MnDNR, MnGeo, MnDot, Scott County

Map Document: \\arcserver1\GIS\BELL\15112777\ESRI\Maps\LandUse\Chapter1\Bell_HydroMap_11x17.mxd | Date Saved: 4/5/2018 3:27:11 PM



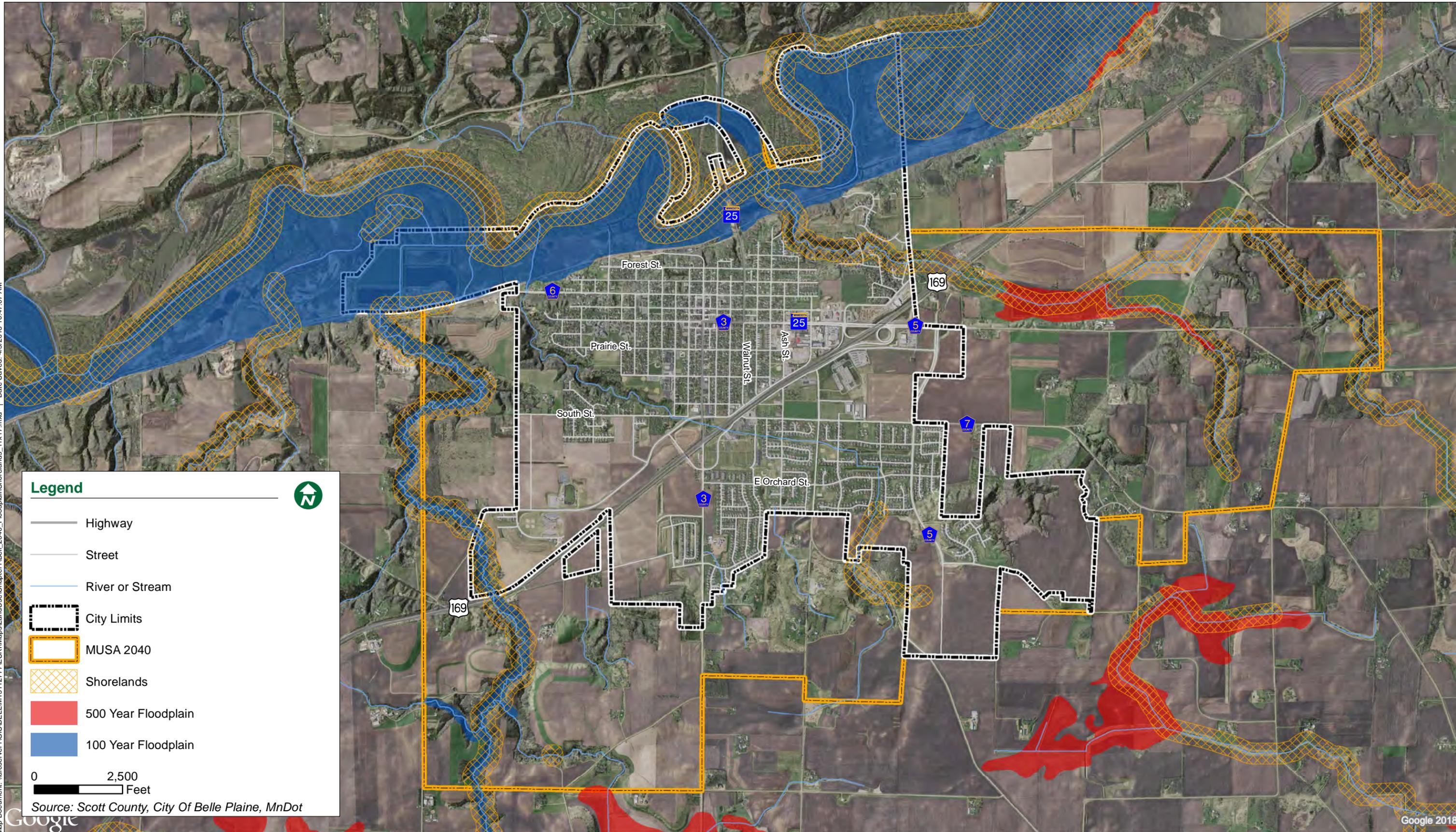
Map Document: \\arcserver1\gis\BELL\M15112777\ESRI\MapServer\Chapter1\Belle_2040_GroundwaterSensitivity_DWSMA_11x17.mxd | Date Saved: 3/30/2018 10:02:31 AM

Legend

- Highway
- Street
- River or Stream
- MUSA 2040
- City Limits
- 10 Year Wellhead Protection
- 20 Year Wellhead Protection
- Proposed DWSMA
- Current DWSMA

0 2,500 Feet

Source: Scott County, City Of Belle Plaine, MnDot



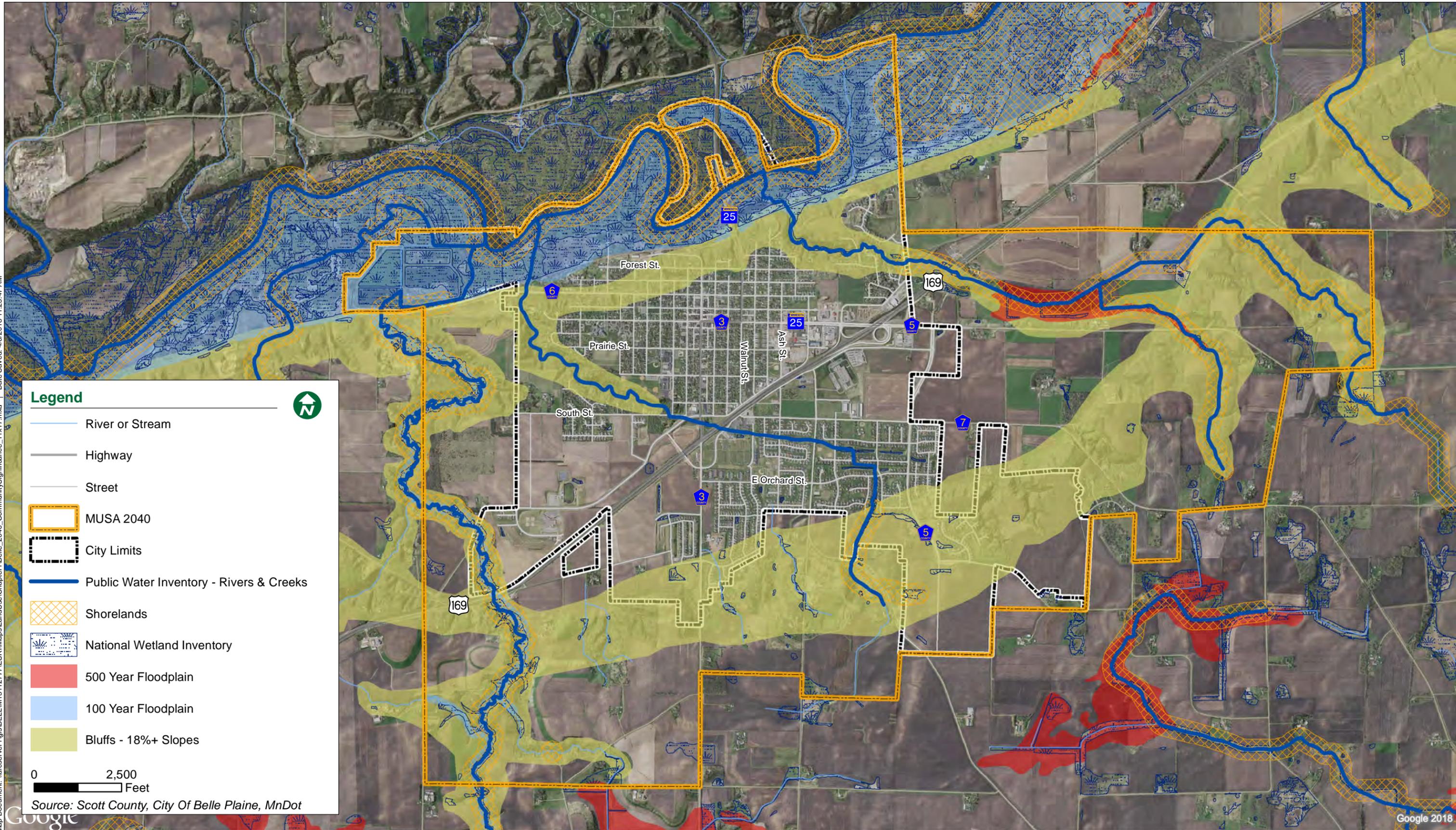
Legend

- Highway
- Street
- River or Stream
- City Limits
- MUSA 2040
- Shorelands
- 500 Year Floodplain
- 100 Year Floodplain

0 2,500 Feet

Source: Scott County, City Of Belle Plaine, MnDot

Map Document: \\arcserver1\GIS\BELL\15112777\ESRI\MapServer\Chapter1\BellePlaine\Shorelands_11x17.mxd | Date Saved: 4/5/2018 10:47:07 AM



Legend

-  River or Stream
-  Highway
-  Street
-  MUSA 2040
-  City Limits
-  Public Water Inventory - Rivers & Creeks
-  Shorelands
-  National Wetland Inventory
-  500 Year Floodplain
-  100 Year Floodplain
-  Bluffs - 18%+ Slopes



0 2,500 Feet

Source: Scott County, City Of Belle Plaine, MnDot

Map Document: \\arcserver1\gis\BELL\M15112777\ESRI\Maps\LandUse\Chapter11\Belle_2040_CommunitySignificance_11x17.mxd | Date Saved: 4/6/2018 11:25:47 AM

Map Document: \\arcserver1\GIS\BELL\Map15112777\ESRI\Maps\LandUse\Chapter1\Belle_2040_CommunitySignificanceAndFutureLandUseMap_11x17.mxd | Date Saved: 12/13/2018 5:27:13 PM

Legend 

 MUSA 2040	 Aggregate Mineral Resources
 City Limits	 100 Year Floodplain
 Public Water Inventory - Rivers & Creeks	 500 Year Floodplain
 Shorelands	 Bluffs - 18%+ Slopes
	 National Wetland Inventory

Future Functional Class

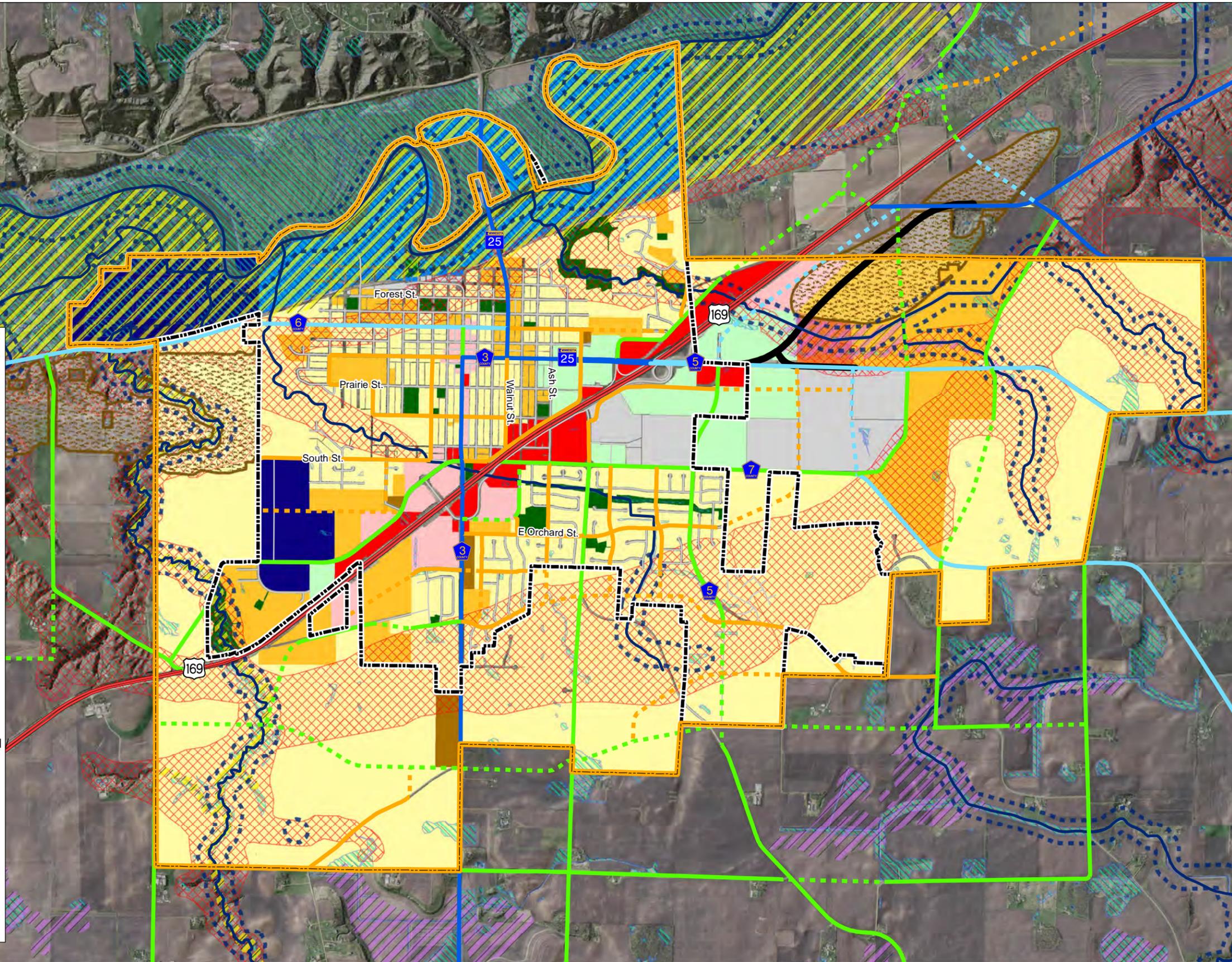
 Principal Arterial	 Proposed Major Collector
 A Minor Arterial-Connector	 Major Collector
 Proposed B Minor Arterial	 Proposed Minor Collector
 B Minor Arterial	 Minor Collector

Future Land Use

 LDR - Low Density Residential	 COM - Commercial
 MDR - Medium Density Residential	 IND - Industrial
 MHDR - Medium to High Density Residential	 MUIC - Mixed Use Industrial Commercial
 HDR - High Density Residential	 PUB - Institutional
 MUCR - Mixed Use Commercial/Residential	 Park/Open Space
	 Floodplain
	 ROW

0 0.5
Miles

Source: Scott County, City Of Belle Plaine, MnDot, MnGeo



Energy Planning

The City of Belle Plaine supports efforts to reduce energy use and greenhouse gas emissions. The City participates in the Minnesota GreenStep Cities initiative and recently updated local code to provide for solar energy production as both principal and accessory uses of property within specified zoning classifications.

Destination 2040 addresses energy planning as a means of:

1. Providing for, nurturing, and supporting the desire of individual residents to actively reduce their energy use and carbon footprint.
2. Increasing availability of alternative energy production opportunities, thereby potentially impacting climate change through a reduction in carbon emissions at a local level.
3. Responding to changes in energy markets and technology enabling consumer options in how they use energy and how they may produce energy.

This section describes existing energy use, available energy resources, and the potential to influence energy system functions in the City of Belle Plaine.

Solar Energy Resources

The Metropolitan Council has provided a solar resource map for the City of Belle Plaine. The map illustrates areas within Belle Plaine with high solar potential.

Most areas with high solar potential are currently undeveloped.

In addition, the Met Council has provided an estimate of the City's "solar reserve" which is based on both gross solar potential and potential rooftops available for solar production. The calculation is expressed in megawatt hours per year. The estimates follow and are based on the aforementioned solar map. Rooftop reserve is approaching the total annual electric energy use as reported in the energy use data supplied by Xcel Energy (see following pages).

The aforementioned calculations estimate the total potential resource before removing areas unsuitable for solar development or factors related to solar energy. The gross solar generation potential and the gross solar rooftop generation potential estimate how much electricity could be generated using existing technology and incorporate assumptions on the efficiency of conversion.

Figure 1.32

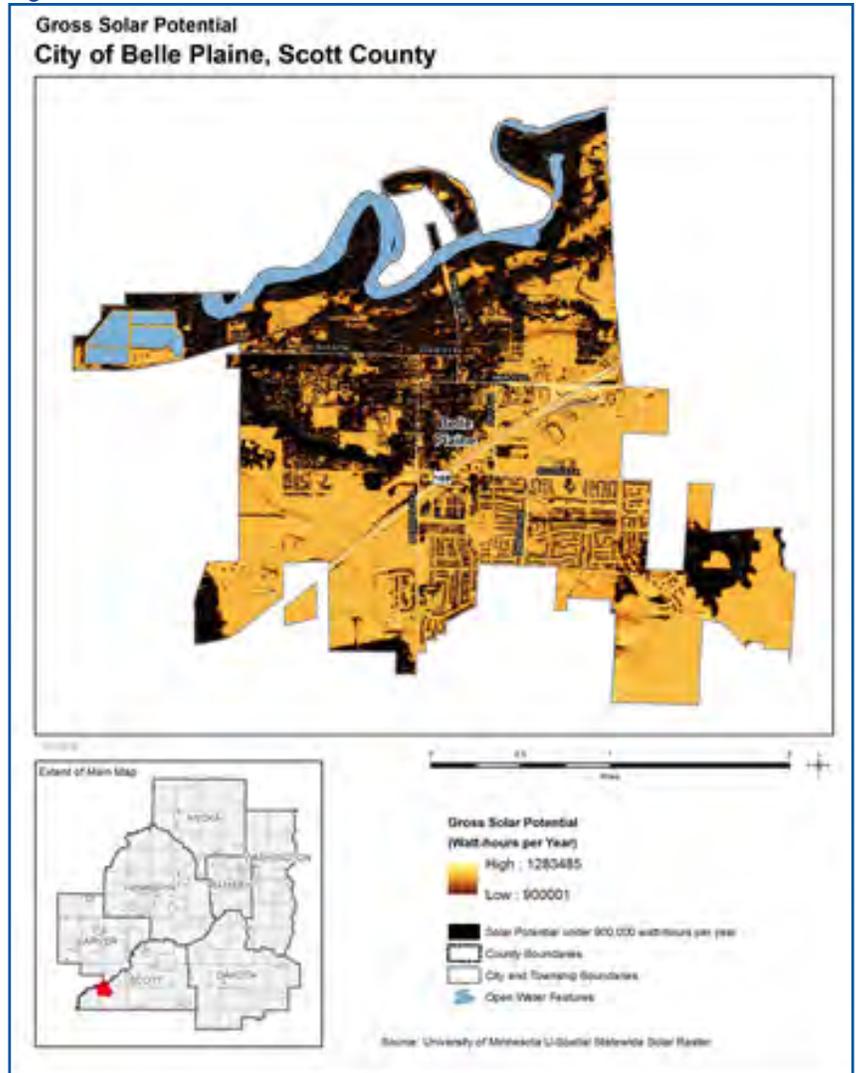


Table 1-1

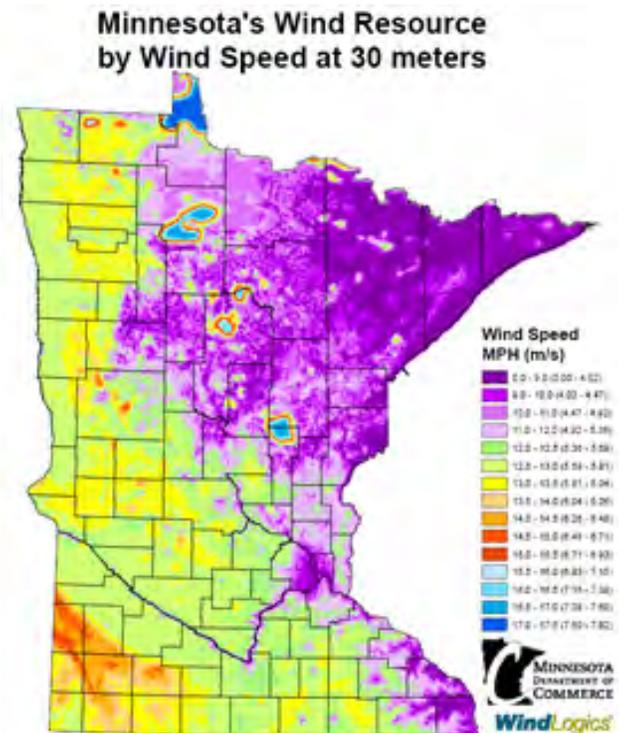
Gross Potential*	Rooftop Potential	Gross Generation Potential	Rooftop Generation Potential
10,698,710	406,631	1,069,873	40,663
* All calculations expressed in megawatt hours per year (Mwh/yr)			

At this time a 5 MW solar energy system is under construction within the Belle Plaine corporate limits. The solar production facility is expected to be operational in 2018 and is permitted through 2052.

Wind Energy Resources

The Minnesota Department of Commerce has developed wind energy maps that illustrates potential wind resources across Minnesota. The maps measure average wind speeds at various hub (turbine) heights above ground. The map included here illustrates average wind speed at a hub height of thirty (30) meters above grade.

Figure 1.33



The low elevation of the Minnesota River and significant vegetation within areas adjacent to the river result in a marginal wind resource evaluation at the 30-meter height.

Although Belle Plaine may not be optimal in terms of siting of wind energy systems, there may be certain areas where wind energy systems could be sited, including on bluffs. Bluffs may also have important avian and bat habitat, but with proper siting and mitigation, wind energy harvesting could occur.

Bioenergy

Biomass or bioenergy resources are quit varied, and are significantly dependent on the type of biomass available in the city/region. Biomass may be created from a variety of sources, including wood, manure, and agricultural byproducts, which are then turned into a fuel sources such as methane gas, ethanol, or biodiesel to be used in electricity generation or for transportation purposes. Due to the scope of needs and interests in the state, multiple state agencies routinely work together on large biomass-related projects.

Biomass resources related to agricultural products (e.g. row crops) and waste products (e.g. manure) are plentiful in rural lands surrounding the Belle Plaine community, but not within the MUSA. On a regional level, sources of biomass, including urban forest management and solid waste are used as energy resources in the Twin Cities Metropolitan Area. For example, the Koda Energy Plant in Shakopee uses wood waste to power an adjacent malt plant. At this time potential large scale commercial or industrial end-users of biomass are not present within the community, that is not to exclude biomass users from smaller scale operations. Biodiesel and E85 are available at three local fueling facilities. City fleet vehicles use standard gasoline/diesel and are not electric/hybrid models.

Energy Efficiency

The Regional Indicators Initiative (RII) provides an assessment of gas and electric energy use by residential, commercial, and industrial class in participating cities. Belle Plaine is not a participatory city at this time, but may join at any time. Actual data collected from participating cities includes:

- Electricity, natural gas, fuel oil, coal and biomass, and district energy consumed for both residential and commercial/industrial use (data source is utility providers).
- Potable water consumption for both residential and commercial/industrial use (data source is municipal water reports).
- On-road distance traveled by all vehicles within the municipality boundaries (data source is the Minnesota Department of Transportation).
- Total municipal solid waste that is landfilled, composted, incinerated or recycled (data source is MPCA SCORE reports and county).

The primary energy provider within the City of Belle Plaine is Xcel Energy. Minnesota Valley Electric Cooperative is the provider for a small area in the northeast portion of the City.

Xcel Energy has provided an energy report for Belle Plaine sourced in the year 2016. The report provides electric energy use rates by customer classification and participation rates for renewable energy and efficiency programs. The report finds:

- System-wide CO₂ emission factors: electric = 0.3650 metric tons CO₂/MWh; gas = 0.0053 metric tons CO₂/Th.
- Energy resource mix:

Table 1-1

Resource Mix	Resource Contribution
Coal	29.00%
Gas	16.00%
Wind	15.00%
Hydro	7.00%
Solar*	0.00%
Nuclear	30.00%
Bio Mass	3.00%
Other	0.00%

*Solar added in 2018

- Energy consumption data (electricity only, data not available for gas):

Table 1-2

Category	Number of Customers	Energy Consumption (kWh)	Carbon Emissions (metric tons CO1)
Business	275	14,488,855	5,2588
Residential	2,517	21,264,302	7,761
Street Lighting - Metered	n/a	14,702	5
Street Lighting - Non-Metered Customer Owned	n/a	14,064	5
Street Lighting - Non Metered Xcel Owned	n/a	331,217	121
Total	2,792	36,113,140	13,181

- Participation in renewable energy and efficiency programs:

Table 1-3

Category	Number of Businesses	Number of Residents
Windsource	1	62
Solar	0	0
Energy Conservation	10	112
Load Management	47	978

According to their website, Xcel Energy offers more than 90 electric and more than 45 natural gas efficiency and load management programs for residential and business customers. Programs include more convenient payment options, rebates for energy efficient upgrades, and the chance to make a difference by choosing renewable energy.

MVEC also provides efficiency programs for residents and businesses. Information is available on the co-op's website.

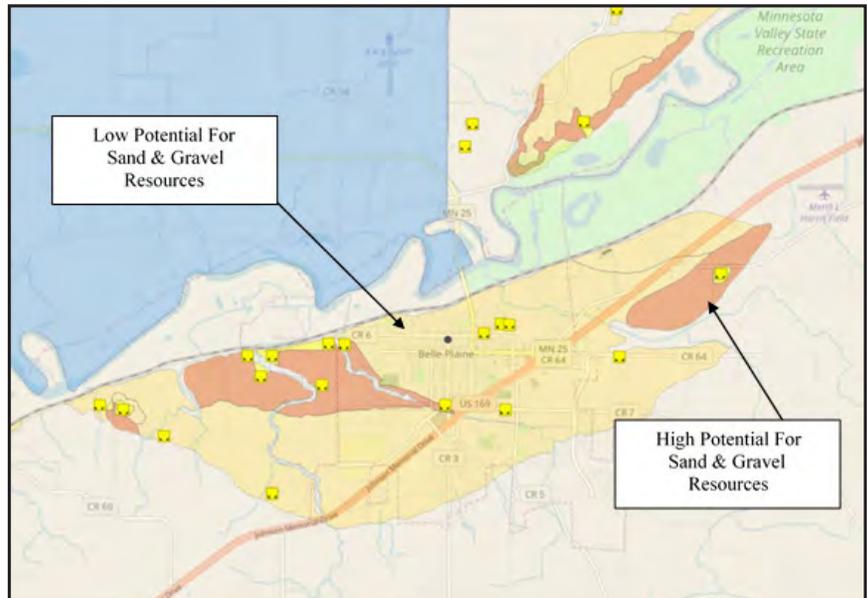
Aggregate Resources

According to a report entitled "Aggregate Resources Inventory of the Seven-County Metropolitan Area", the Twin Cities area historically was rich in sand and gravel and dolomitic bedrock resources. However, aggregate resources have been significantly depleted or access to said resources restricted so as to reduce supply needed for present-day industry standards. The report indicates that if continued urban expansion, potential zoning restrictions, and/or other factors are not addressed, aggregate supplies may be exhausted as early as 2028.

Since jurisdictional choices have a significant impact on future aggregate supply and cost it is imperative possible resources are identified. Figure 1.34

illustrates locations with high potential for sand and gravel resources (brown) and locations with low potential for sand and gravel resources (tan) in the Belle Plaine vicinity. Several areas are previous and or current pit sites. It is noted primary resources are contained west and northeast of areas currently served by municipal utilities.

Aggregate resources are illustrated on the Planned Land Use Map contained in Chapter Three of Destination 2040. Most sand, gravel, and aggregate deposits with the MUSA are located external to the corporate limits within areas subject to orderly annexation agreement (OAA).



Local land use regulations provide for extractive uses both within the OAA area and within the City limits. Under OAA agreement terms, properties are not annexed into the City until urban development is imminent. Scott County has land use authority in the OAA areas with projects being approved by joint planning boards. Scott County zoning provides for extractive uses through interim use permit (IUP). The County, Townships, and City have approved IUP to allow for extractive uses prior to development. Additionally, the City's zoning standards provide for extractive use, where appropriate, under conditional use permit. Both County and City use standards require detailed extraction plan review and reclamation plans as means of minimizing potential land use conflicts.

Our Goals and Policies

The City accepts and embraces the fact land, water, and air are finite resources integral to long-term health, safety, and well-being of all. As such we recognize the importance of community stewardship and sustainability and the intrinsic value of nature. We are committed to the following goals and policies:

- NR 1. Balanced sustainable growth and redevelopment which values, respects, and protects Belle Plaine's ecological, physical, and scenic assets and flora and fauna.
 - 1.1. Emphasize ecological, cultural, and scenic assets in public information and marketing plans.
 - 1.2. Cultivate environmentally conscious businesses.
 - 1.3. Elevate knowledge of and support for biodiverse open space and green space preservation at the time of development review.
 - 1.4. Consider biodiverse green spaces and connectivity thereto as fundamental components of public improvement projects.
 - 1.5. Maintain scenic vistas, bluffs, ravines, riparian acreage, open space, and green space currently under public ownership.
 - 1.6. Identify, preserve, and plan for linkages or connections (with or without a public access component) to open/green space.

- 1.7. Undertake a public information campaign to highlight requirements of land and water preservation standards included in the City Code.
- 1.8. Pursue public discourse regarding minimizing light pollution.
- 1.9. Research potential infrastructure changes with the potential to minimize and/or reduce the impact of global climate change.
- 1.10. Support and allow appropriate lifestyles which reduce causes and impacts of global climate change.
- 1.11. Consider wildlife when reviewing development, redevelopment, and transportation projects.
 - i. Consider preventing entrapment and death of small animals including reptiles and amphibians by specifying biodegradable erosion control netting rather than plastic mesh netting.
 - ii. Consider providing wider culverts or other passageways under paths, driveways, and roads while still considering impacts to floodplains.
 - iii. Consider including passage benches under bridge water crossings.
 - iv. Consider curb and inlet designs that don't inadvertently direct small mammals and reptiles into the storm sewer.
 - v. Consider smart salting practices that reduce impacts to downstream mussel beds and other species.

NR 2. Abundant and pure groundwater, surface water, and air resources.

- 2.1. Protect, preserve, and control public drinking water production and distribution systems.
- 2.2. Protect groundwater quality.
- 2.3. Be mindful of, monitor, and improve surface water quality and quantity.
- 2.4. Dutifully examine development/redevelopment projects as they pertain to standards and best management practices for water and air quality control.
- 2.5. Dutifully enforce existing rules and regulations pertaining to groundwater, surface water, and air quality.
- 2.6. Research, evaluate, develop, and recommend potential measures to safeguard water and air quality.
- 2.7. Support efforts to increase water quality of the Minnesota River.
- 2.8. Consider protecting riparian areas adjacent to protected waterways, including South Creek in the vicinity of Hickory Boulevard, as platting and/or (re)development occurs by requiring parkland or open space preservation areas secured by easement.

NR 3. Broad-based, active public and citizen participation in sustainability and stewardship efforts.

- 3.1. Strive to attain Step 5 in the GreenStep Program.
- 3.2. Strive to attain Gold status as a SolSmart community.
- 3.3. Join Regional Indicators Initiative (RII) and monitor community-wide energy use (gas and electric) and vehicle transportation energy.
- 3.4. Consider adopting/embracing Minnesota's greenhouse gas (GHG) reduction goal of 80% GHG reduction by 2050 (Minnesota goal set in 2005).
- 3.5. Consider formally adopting Minnesota's aspirational target of striving for solar energy target of ten (10) percent of retail sales.
- 3.6. Ensure protection and enable development of solar resources by re-examining land use and subdivision standards to provide residents and business ready access to solar resources
- 3.7. Partner with the School District and local media to report environmental indicator status and trends and local efforts to positively impact said indicators.
- 3.8. Encourage, nurture, and support community organizations and individuals concerned with environmental issues and local ecosystems.

- 3.9 Actively remove barriers to and explore potential incentives in support of green building practices and deployment of environmentally supportive principles/practices.
- 3.10 Encourage environmental projects and education programs for citizens of all ages.
- 3.11 Become a decisive leader in the region in regard to environmental stewardship, sustainability, issues identification, regional efforts, and hazard mitigation.
- 3.12 Begin to make Belle Plaine “EV-ready” by incorporating electric vehicle charging stations in public parking lots.
- 3.13 Increase fuel economy of City vehicle fleet.

NR 4. A community that reduces, reuses, recycles, and safely disposes of waste streams.

- 4.1 Pursue mutual goals with area partners to expand recycling efforts, including organics.
- 4.2 Promote the use of recycled content products for public purchases and development projects seeking business subsidies.
- 4.3 Dedicate a portion of The Bridge and social media posts on a regular basis to highlighting recycling, solid waste minimization and reduction efforts.
- 4.4 Encourage alternative uses other than disposal for construction/demolition materials.
- 4.5 Investigate methods to raise awareness of and provide options for recycling and composting of organic material.

NR 5. Responsible use of finite, non-renewable natural resources.

- 5.1 Highlight City goals/policies related to open space preservation, scenic vista protection, bluff/ravine preservation, mineral resource conservation, water quality, and safeguarding of urban forests at the initial meeting with development contact(s).
- 5.2 Raise awareness of and deployment of alternate, renewable resources.
- 5.3 Quantify energy use and efficiency, establish benchmarks for improved performance.
- 5.4 Allow for and support green building practices in both the public and private sector.
- 5.5 Promote and support resource efficiency through Leadership in Energy and Environmental Design (LEED) practices at all phases of development and in all types of construction.
- 5.6 Increase walking, cycling, and shared transportation platforms through infrastructure development as a means of promoting community health, lowering the use of non-renewable resources, and decreasing energy consumption.
- 5.7 Encourage tree planting to reduce energy use.
- 5.8 Consider public fleet vehicle purchases relative to fuel efficiency and use of non-renewable resources.

NR 6. Appropriate management, collection, disposal, and per capita reduction of stormwater, wastewater, solid waste, and household hazardous waste.

- 6.1. Support Scott County’s informational campaigns and outreach efforts pertaining to disposal of hazardous waste and reduction/proper disposal of solid waste.
- 6.2. Continue to prioritize sanitary environments along streets, alleys, and public properties.
- 6.3. Enforce local code and building standards providing for conservation of water and reduced wastewater flow.
- 6.4. Encourage conservation design principles/practices and natural infiltration of rainwater and snow melt.
- 6.5. Meet/exceed federal, state, and local regulations for environmental quality.

NR 7. Pristine, unspoiled bluffs, prairies, wetlands, waterways, and natural areas.

- 7.1 Identify, restore, and protect rare, native, and sensitive floodplain, prairie, woodland, and riparian habitat and be conscious of evolving knowledge of management techniques.
- 7.2 As development/redevelopment occur, encourage protection and restoration of bluffs, ravines, prairies, wetlands, and the river corridor.

- 7.3 Partner with community groups to demonstrate and educate the community on best practices for ecological design.
- 7.4 Take the National Wildlife Federation's "Mayor's Monarch Pledge" to raise awareness of and demonstrate a commitment to creating habitat for the Monarch Butterfly and pollinators.
- 7.5 Focus on creating an attractive City built around unspoiled bluffs, prairies, wetlands, waterways, and natural areas.

NR 8. A clean and beautiful City supported by robust and flexible public/private partnerships.

- 8.1 Enforce illegal dumping and litter prevention rules and regulations.
- 8.2 Continue annual 'recycling day' event.
- 8.3 Encourage downtown and neighborhood beautification efforts.
- 8.4 Encourage planting of native species conducive to urban native wildlife and pollinators.
- 8.5 Consider parkland, shoreland, and roadway 'adoption' programs.