

NATURAL RESOURCES & SUSTAINABILITY

7

GUIDING PRINCIPLES.....	7-120
SUSTAINABLE & RESILIENT.....	7-121
GROUND WATER SUPPLY & WATER CONSERVATION.....	7-121
SURFACE WATER MANAGEMENT.....	7-122
WASTE REDUCTION.....	7-123
ENERGY.....	7-123
HEALTHY LIVING / FOOD ACCESS.....	7-126
NATIVE PLANTS/HABITAT.....	7-128
TREES.....	7-130
INVASIVE SPECIES.....	7-131

Protection and enhancement of the City's natural resources and its environmental setting will assist in the City's goal of becoming more resilient in the face of an evolving climate. The environmental setting contributes to the quality of life enjoyed by its citizens. Wetlands, open space and lakes comprise about one-third of the City's area, much of which remains is due to the City's tradition of protecting its natural resources from development. Current and future residents benefit from these past efforts. Natural resources play a part in the resiliency of the City's public wealth and should be managed as any other asset. Also critical to the City's resiliency is its commitment to resource conservation and environmentally sustainable operations. As a fully developed community, a focus on environmental protection and resource conservation measures will provide long-term preservation of its natural and built environment.

GUIDING PRINCIPLES

WATER SUPPLY AND CONSERVATION

Provide for a sustainable, reliable and secure supply of high quality water to support the City's needs and maintain the City's health.

NATIVE PLANTS/HABITAT

Protect and expand the City's native plants and habitat.

TREE CANOPY

Protect and increase the quality, quantity and diversity of the City's tree population.

INVASIVE SPECIES

Continue to identify and remove invasive species on public property and facilitate property owner's efforts in the same.

SUSTAINABILITY VISION FOR 2040

The year is 2040, and White Bear Lake is a sustainable and resilient community. Our socially cohesive and well-informed neighborhoods are able to survive and recover from natural disasters quickly. The City contains an array of services that can be comfortably reached by walking, bicycling or public transit. The housing stock offers a wide variety of housing types at all income levels. The community enjoys a number of full-service grocery stores, as well as access to community gardens and a year-round farmers market. High-quality, clean and well-utilized parks and community facilities support residents' active lifestyles. The City has lowered its carbon footprint by 80% and is providing guidance for residents and businesses to do the same. Solar panels can be seen on both residential and commercial rooftops throughout the City. The City is a Step 5 Greenstep city with curbside composting. Since the City worked with the County to establish a "boulevard" tree planting program, the City's major thoroughfares have improved appearances, reduced carbon footprints, improved walkability, and improved property values along these corridors. Increased tree diversity has improved our resistance to pests and a focus on reintroducing native species has helped improve pollinator and wildlife habitat. Since the City worked with the Minnesota Department of Resources (MnDNR), watershed districts and the White Bear Lake Conservation District (WBLCD) to incentivize the owners of riparian parcels to naturalize their shoreline, the water quality and biodiversity of our water bodies have improved.

SUSTAINABLE & RESILIENT

Sustainability is described as the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. Resiliency is described as having the capacity to respond and adapt to changing conditions, as well as to mitigate the impacts. Climate resiliency is further described as the reduction and mitigation of greenhouse gases. Reduction is accomplished primarily through energy conservation and the transition to renewable energy. Mitigation can be accomplished by capturing existing carbon through methods such as increasing the size and number of trees.

The ability to adapt to natural disasters in Minnesota is a measure of climate resiliency. Natural disasters in Minnesota include floods, tornadoes, winter storms, fires, power outages and drought. The state is already experiencing more frequent extreme weather events. According to The Minnesota Environmental Quality Board, Minnesota has experienced four “1,000 year” rainfalls since 2002. The City is well positioned in that it is located at the top of four watersheds and has a fully built-out and effective storm sewer system. Consequently, flooding is not as severe an issue as it is for other communities. Flooding is further addressed in the Surface Water Management Plan.

Fires release carbon into the atmosphere and reduce air quality. Reduction in air quality can affect the health of plants, animals and people, and can limit views and visibility. The City of Minneapolis has a Green Business Cost Share Program that focuses on reducing air pollution from small business such as dry cleaners and auto body shops by providing funds to switch to nontoxic or lower toxic chemical alternatives. The City of White Bear Lake could consider a similar low-interest loan program for local businesses.

Urban heat island effect is when temperatures within an urban area are warmer than the less developed areas around it. It can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution, heat-related illness/mortality and water quality. Trees are one of the best ways to combat urban heat island effect.

GROUND WATER SUPPLY & WATER CONSERVATION

The City's Local Water Supply Plan has been updated and submitted to the Metropolitan Council for review. There are two outstanding issues of the water supply plan that remain unresolved as they relate to the lake level lawsuit: ground water monitoring and irrigation limitations. The City tracks the depth of the aquifer at each of the four operational wells. The City also has irrigation regulations in place, but those restrictions may need to be tightened pending the result of the DNR lawsuit appeal.

For purposes of this plan, water conservation relates to ground/drinking water. Water conservation is the most cost-effective and environmentally sound way to insure our demand for drinking water continues to be met in the future. Conservation stretches our supplies farther, and protects our water resources. Using less water also puts less pressure on our sewage treatment facilities and saves energy as water requires energy to be heated.

Public awareness and participation in water conservation has improved significantly in recent years. This is evidenced by a 20% decline in total water demand over the past 10 years. At 67 gallons per person per day, the City of White Bear Lake has the second lowest residential water use of the outer-ring suburbs studied between 2007 and 2013. However, future per capita use may increase slightly as more households with younger children move into the area. While great strides have been made, continued water conservation efforts are critical to the protection of the supply for future generations to come.

In early 2016, the City revised the water utility rate from a tiered rate structure to a seasonal rate structure, intended to encourage water conservation during the summer months. The City has also promoted water conservation through the “Make a Splash” campaign, sponsored by the non-profit organization MN Clean Energy Resource Teams (CERTs). The City purchased 200 low-flow faucet aerators to distribute to residents. The aerators use 1.0 gallon per minute, instead of the average 2.2 gallons per minute. They generate tremendous water savings, and do not affect the water pressure. Other existing water conservation practices and programs include: the rain barrel sales, stormwater reuse systems for irrigation in Lakewood Hills Park and Boatworks Commons, time-of-day lawn watering restrictions, and the new water efficiency rebate program.

SURFACE WATER MANAGEMENT

The City of White Bear Lake Surface Water Management Plan (SWMP) is a document that provides the framework for a comprehensive program to protect and improve the quality of water resources within the City. The SWMP has been prepared in accordance with Minnesota Statutes and Rules and is consistent with the Ramsey Washington Metro Watershed District (RWMWD), Rice Creek Watershed District (RCWD), Valley Branch Watershed District (VBWD), and Vadnais Lake Area Water Management Organization (VLAWMO) plans. The Metropolitan Council requires that the SWMP be included in the Comprehensive Plan in its entirety, either as a chapter or as an appendix. The City of White Bear Lake’s SWMP can be found as an appendix of this plan.

The City’s SWMP serves as a reference document with information on the physical environment and specific water resources within the City, regulatory requirements related to surface water management, recognition of current design standards, and highlights of past projects. The plan also identifies several issues that the City has encountered or

is likely to encounter in the coming years. To address these issues, a set of goals and corresponding implementation items were identified and grouped by issue area to guide surface water management activities over the 10-year timeframe of the plan.

ISSUE AREAS

- » Stormwater runoff management and flood control
- » Lake, stream, and wetland management
- » Natural resources and recreation
- » Groundwater management
- » Public education and participation
- » Regulatory permit and review
- » Pollution prevention, operations, and maintenance
- » Funding

The issues and objectives were used to direct the preparation of the implementation program described in the SWMP. The City's implementation program involves a range of capital improvement projects, programs, studies, and ongoing inspection and maintenance activities.

WASTE REDUCTION

There is no such thing as waste, only a resource that is in the wrong place. While the City of White Bear Lake is not going to be the first zero-waste community in the nation, heading in that direction is fundamental to sustainability and resiliency. Rethinking our relationship with material goods and how we discard them - including reusing, recycling, and composting - will help reduce waste. These discussions, along with refuse collection, can all be found in the Solid Waste section of the Public Facilities and Services Chapter.

ENERGY

The availability of energy resources is important to residents, businesses, developers, institutions, and all levels of government. Energy heats and cools our indoor environments, fuels our vehicles, and powers our computers, appliances, and equipment. Energy is critical to our modern personal, vocational and professional lifestyles and, as continuing technology advancements are made, our reliance on energy resources increases.

Energy conservation and application of renewable energy technologies are critical to the sustainability of our modern way of life. According to MN's 2025 Energy Action Plan 58% of total energy consumed in Minnesota is lost through inefficiencies. The City would like to see an increase in the use of green building standards (such as LEED) during construction of both public and private projects. Additionally, application of renewable energy technologies through reliance on photovoltaic systems (solar panels) are increasing in prevalence around the City. The City allows solar panels as an accessory use in all districts. Roof-mounted systems are allowed by right and low-profile ground-mounted systems are allowed by administrative variance on residential properties and limited to accessory structure regulations in commercial and industrial properties. Taller systems, such as car canopy style, would be welcomed on commercial or industrial properties with proper design through the variance process for height.

Figure 7.1 Energy Use by Type (MMBtu)



ENERGY USE PROFILE

The types of energy used in the City of White Bear Lake for buildings and industrial processes are primarily electricity and natural gas. The data in Figure 7.1 indicates that White Bear Lake consumers use more natural gas than electricity with nearly two thirds of energy consumed being natural gas. Figure 7.2 illustrates that White Bear Lake's residents use approximately the same amount of energy as businesses and industry, however, there are more than 8,500 residential customers compared to only 800 commercial and industrial customers. Between both residential and commercial/industrial, utility energy consumption costs White Bear Lake residents and businesses \$28.7 million in 2017.

Figure 7.2 Energy Use by Sector (MMBtu)



Figure 7.3 Greenhouse Gas Emissions by Energy Type (Tons CO2)



Greenhouse gas emissions are emitted from burning conventional fuels like coal and natural gas, both of which are used for the production of electricity. Electricity makes up approximately one third of the building energy consumption in the City, Figure 7.3 shows that a significantly greater share of greenhouse gasses come from the use of electricity.

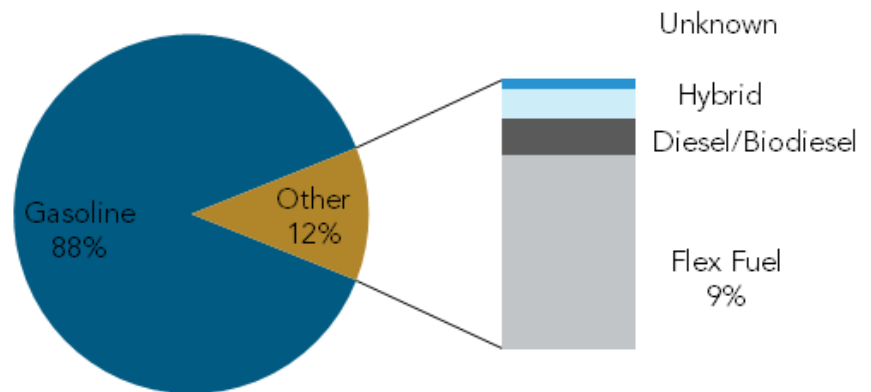
Figure Sources: Regional Indicators Initiative

TRANSPORTATION ENERGY USE PROFILE

Transportation is almost exclusively attributed to car and truck travel and is estimated by vehicle miles traveled (VMT) within the City boundaries (regardless of through traffic or with an origin or destination in the City). VMT includes commercial and freight vehicles, personal cars, and mass transit vehicles. VMT does not capture energy attributed to rail and aircraft, but those are generally a very small portion of transportation energy. Data shows that 2,014,283,869 vehicle miles were traveled in the City of White Bear Lake in 2016. Greenhouse gas emissions associated with this travel are approximately 93,028 tonnes of CO₂e. The estimated costs of vehicle transportation fuel in White Bear Lake is \$32.8 million each year.

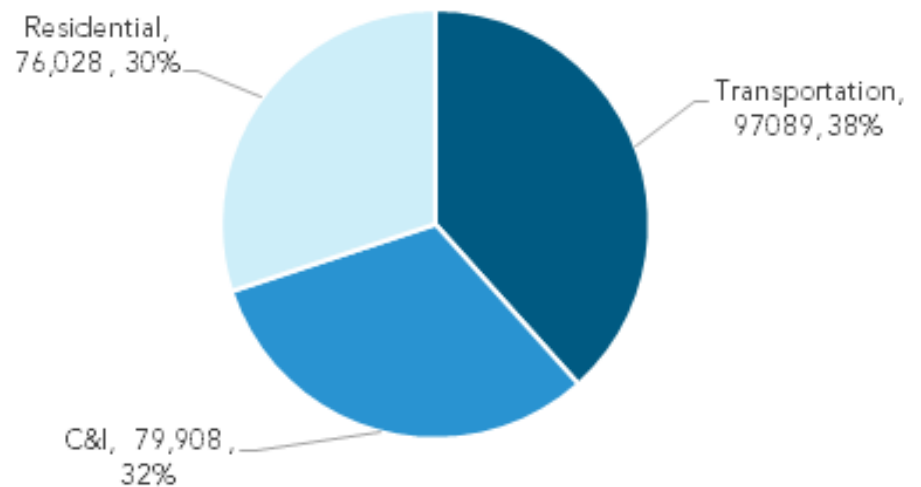
As Figure 7.4 shows, gasoline makes up 87% of private vehicles driven in the City, while hybrid, diesel/biodiesel and flex fuel make up the other 12%. Future changes to the auto industry could significantly reduce the emissions generated by vehicular traffic. Electric vehicles are emerging as an alternative to combustion engine vehicles and will be worth noting in future energy profiles.

Figure 7.4 WBL Light Duty Vehicles by Fuel Type



Source: USDOE City Energy Profiles

Figure 7.5 Greenhouse Gas Emissions by Sector (Tons of CO₂)



Source: Regional Indicators Initiative

GREENHOUSE GAS EMISSION SUMMARY

The energy use data gathered for building energy consumption and transportation illustrates a clear picture of the primary sources for GHG emissions in the community. Figure 7.5 summarizes the greenhouse gas emissions sources for the City of White Bear Lake. The greatest source of emissions in White Bear Lake is building energy consumption, making up 62% of total emissions. Broken down by sector, commercial and industrial sector emits 32% of all emissions, and residential energy use accounts for 30% of emissions. Transportation emissions make up 38% of total emissions.

Additional sources of emissions not included in this graph come from air travel, waste, wastewater treatment processes. These emissions can be reported in a deeper analysis of GHG emissions or as part of a community-wide GHG inventory.

Conducting a municipal operations greenhouse gas assessment in conjunction with a more comprehensive community-wide assessment would provide a complete picture of existing conditions. The insight gathered would help the City identify and prioritize areas to target for improvement. Establishing a baseline of emissions and updating the data on a regular basis is critical to understanding the efficacy of our efforts and achieving reduction goals.

HEALTHY LIVING / FOOD ACCESS

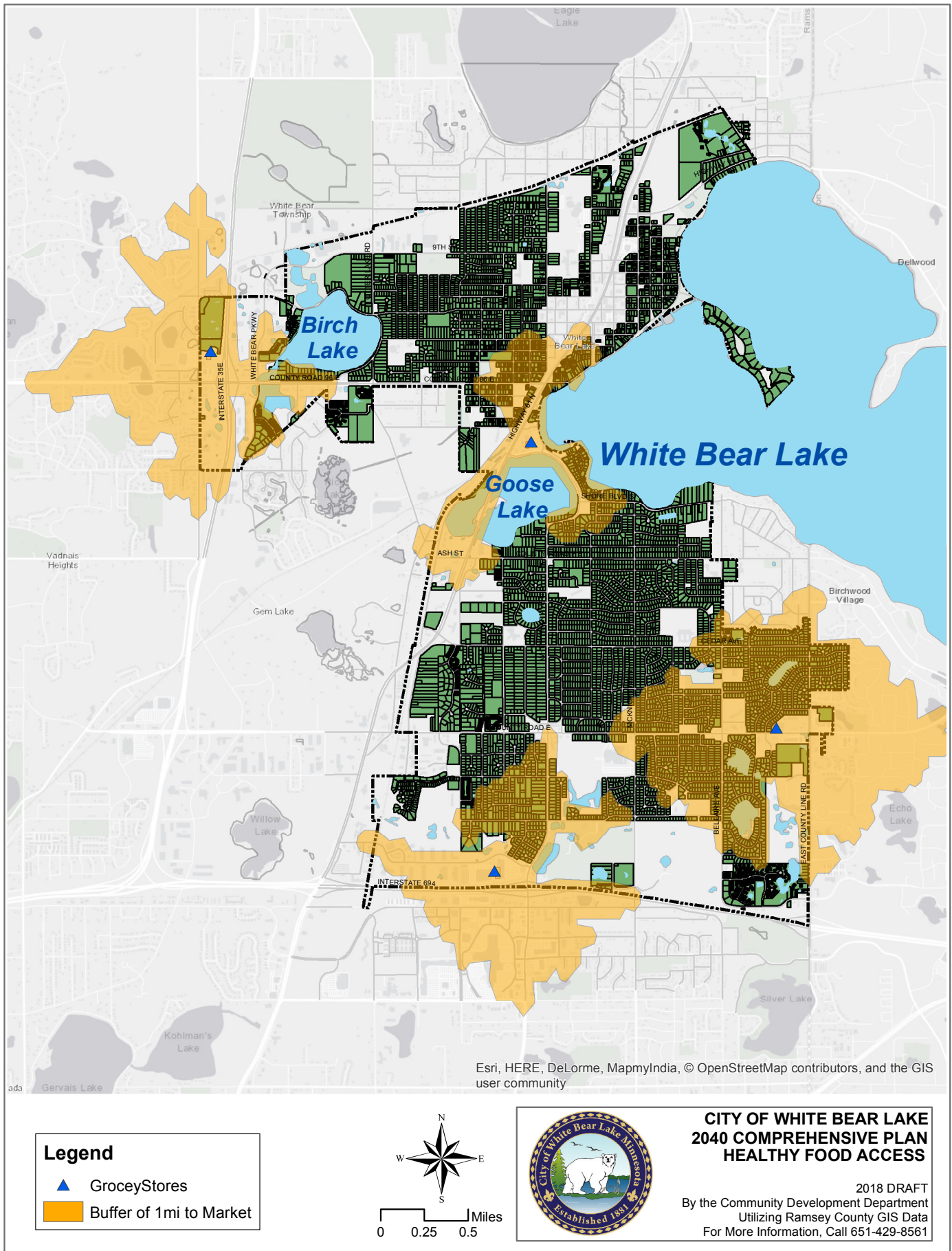
Healthy living includes maintaining recreational opportunities and facilities that reflect the community's diverse interests. The ability to easily walk and bike is an important aspect of this topic as well; trails and connectivity are addressed in the Transportation chapter.

Easy access to healthy food options is an important quality of life issue. Food access includes grocery stores, vegetable stands, farmer's markets, Community Supported Agriculture (buying direct from a farmer) and community gardens. The City of White Bear Lake could be called food rich. We have four full-service grocery stores where fresh food can be purchased year round. The Food Access Map (Figure 7.6) highlights residential parcels within one mile of each of these locations. The City also benefits from a large, centrally located community garden and a local farmer's market during the summer. Food has long been a reason why people gather and that gathering creates a hub for community life. Similar to Manitou Days, the local farmer's market and community garden help to foster the strong social ties the city's residents enjoy, an important aspect of community resiliency.

Two programs which serve as great examples of the community's proactive approach to food access are Giving Gardens, which facilitates residents' ability to donate fresh produce to the local food shelves, and the Bear Power program, a community-wide movement with 30 partners that promotes programs and events to make it easier for kids to eat well and be active in the White Bear Lake area.

Local food production reduces food miles – the distance that food must travel - and consequently greenhouse gas emissions. Food in a grocery store typically travels 1,000 miles or more while the typical food in a farmer's market travels less than 1/10th of that distance. In addition to reducing the miles traveled, local food supports the local economy and enhances regional security in the event of shortages (also important for resiliency). Within the last 10 years the City has passed ordinances allowing the keeping of both bees and chickens on residential properties. The city may want to consider expanding these allowances to school properties. Ducks and turkeys may also be reasonable for residents to raise. Finally, if demand encourages such, the City could consider the appropriateness of accessory beekeeping on commercial and industrial properties.

Figure 7.6 Food Access Map



NATIVE PLANTS/HABITAT

A public land survey was completed between 1847 and 1907 prior to opening Minnesota to land sale and to European settlement. Surveyors recorded the size and species of larger trees and the physical geology of the landscape. Although not a detailed vegetation survey, the records provide a valuable account of what Minnesota looked like at the time of European settlement. In 1930, Francis J. Marschner used the Public Land Survey to create the Map of the Original Vegetation of Minnesota, which details the different types of vegetation that existed in Minnesota before it was settled by Euro-Americans. Figure 7.7 shows the presettlement vegetation in Ramsey County based on the Marschner Map.

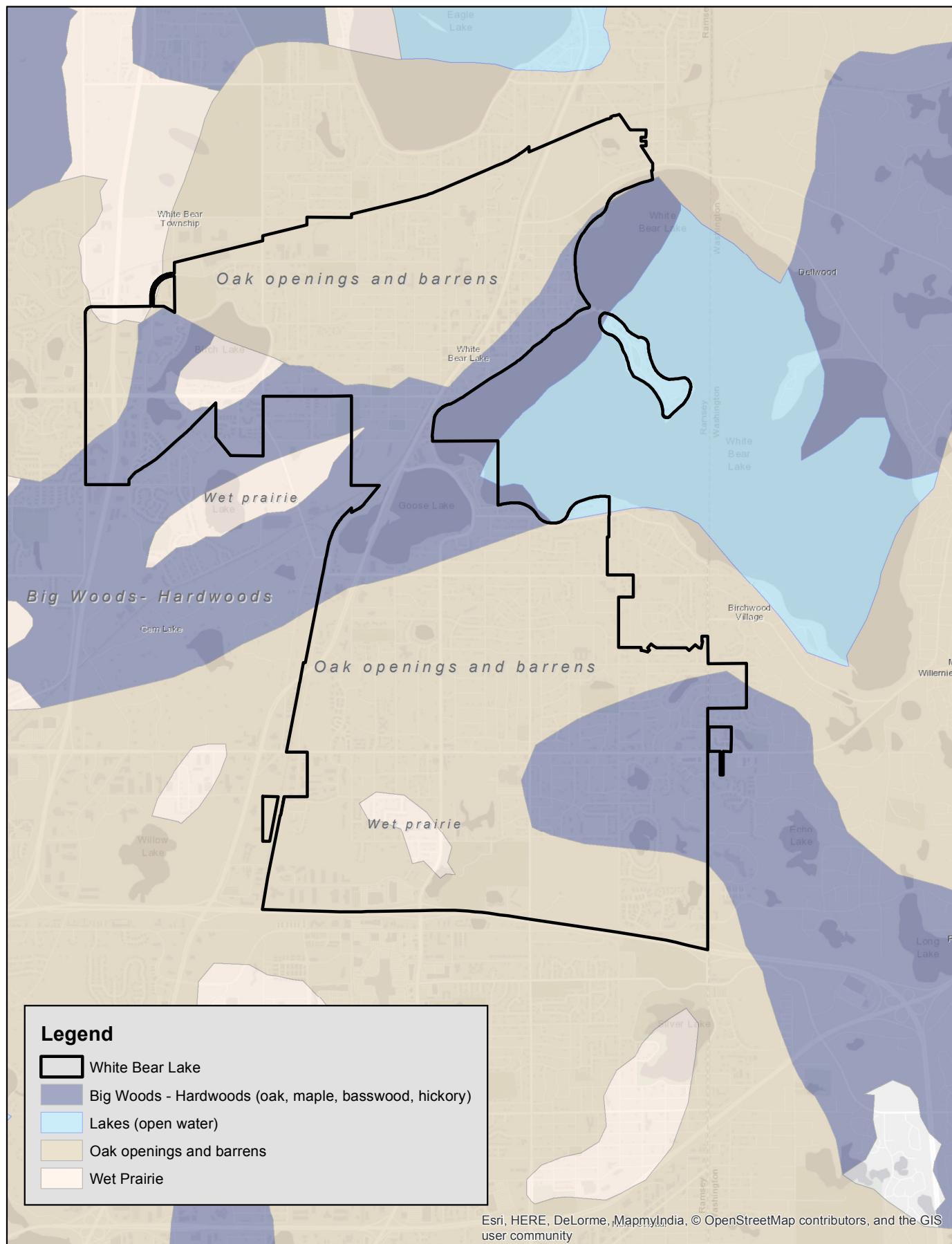
In just over a century after the Public Land Survey, nearly all of the natural vegetation communities in Minnesota have either disappeared or have been substantially altered. In the City of White Bear Lake, the remaining natural communities exist as small remnants in parks, wetlands, and around lakeshores. The City has an interest in collaborating with Watershed Management Organizations, Ramsey County, Lake Conservation Districts, and local native plant groups to protect and restore these remaining natural resources and to find additional locations to re-establish the native plant communities similar to what once existed in this area.

Native plants and habitat is most impactful along the shorelines of our lakes. Vegetation along the edge of a water body, (including trees):

- » Prevents or reduces bank erosion, as the deep roots of the plants tend to be more effective and are the preferred alternative to stabilize soil than rocks on the surface;
- » Provides wildlife food and habitat for insects and birds;
- » Improves fish habitat by provide hiding places;
- » Filters out pollutants; and
- » Adds beauty and grace to views both of and from the shore.

Shorelines provide food and shelter for fish and wildlife. The complex interplay of plants, animals, land and water combine to make the shoreline the most important part of a lake's ecosystem. The terracing and denaturalization of the lakeshore has a detrimental effect on a lake's ecosystem and water quality, which has a direct effect on property values and hence quality of life. A UW-Stout study showed that for every foot of water clarity, property values go up about \$3,650. A study of over 3,000 real estate transactions over 10 years on 7 Wisconsin lakes indicated lakes with poor water quality had property values two to three times lower than lakes with good water quality. This is evidence that how we manage shoreline affects more than just the lake. The addition of new retaining walls and flattening out of the land between the retaining walls should be limited.

Figure 7.7 Pre-Settlement Vegetation



There is increasing evidence that insect pollinators are in serious decline. Major factors in the decline of pollinator species include habitat loss and systemic insecticide use. The City is committed to supporting pollinators by incorporating key native pollinator plant species in restoration projects, shoreline plantings, and park plantings. The City will encourage developers of private lands to use native flowers, grasses, shrubs and tree species. The City will prepare a list of preferred plant species for reference and to guide designs for public and private development projects. The City will also preferentially choose plants and seeds that have not been treated with systemic insecticides. A Pollinator Friendly Resolution supporting this commitment was passed by City Council on April 12, 2016.

TREES

Trees modify air temperature, solar and thermal radiation exchanges, and humidity of the air, all of which influence human comfort. Trees act as wind breaks, noise buffers and screening. Their beauty inspires writers and artists, while their leaves and roots clean the air we breathe and the water we drink. Trees provide valuable environmental benefits beyond just wildlife habitat. Maximizing tree cover and minimizing impervious surface serves our ecosystem by reducing stormwater runoff, decreasing erosion, storing and sequestering atmospheric carbon and reducing energy consumption due to direct shading of buildings. Even a dead and decaying tree serves to replenish the nutrients in soil. Finally, there is also evidence that trees increase community pride, positively impact consumer behavior, and increase property values.

Over the decades, tree cover has decreased as the City has developed, particularly during the lumbering and farming era of the early 1900's. More recently, on average, the City plants approximately 25 to 30 trees per year in public parks during Arbor Day, and removes approximately 5 to 10 annually from the City's parks. In 2017, 38 trees were removed from the street boulevards and not replaced. Tracking of tree planting through private development and redevelopment plans (Tree City USA submittal requirements) indicate that tree planting may exceed tree removal, when counted one for one. However, if conducted, caliper inch per caliper inch (size) comparisons would likely tell a different story. Also, there is no way to track the replacement of trees removed on private properties that are not being developed/redeveloped.

With the rise of invasive species such as Dutch elm disease and Emerald ash borer, it is vital that our urban forest be intentionally replenished and increasingly diverse. A vigorous planting schedule for public parks, private properties and road right-of-ways will help to off-set the impacts of climate change and increased urbanization. The City will consider a comprehensive tree inventory followed by a community forestry management plan. If autonomous vehicles change our driving/transportation patterns in such a way as to reduce the need for parking, the "recaptured" space created should be used for tree planting as much as possible; such a rare opportunity to convert hard-surface back to greenspace should not be missed.

INVASIVE SPECIES

Invasive species are a leading threat to the City's remaining natural areas. An invasive species is a plant or animal that is not native to Minnesota and that has a tendency to spread to a degree believed to cause damage to the environment, human economy, or human health. (Wikipedia) Invasive species cause harm by outcompeting native species, destroying habitat and food sources for native insects, birds, and other wildlife. There are several laws and regulations in place intended to minimize the introduction and spread of terrestrial (land-based) and aquatic (water-based) invasive plants and animals. This section of the Comprehensive Plan highlights terrestrial invasive plants and animals found in and around the City of White Bear Lake. Goals and objectives related to aquatic invasive species are included in the City's Surface Water Management Plan.

TERRESTRIAL INVASIVE PLANTS

The Minnesota Department of Agriculture (MDA) regulates terrestrial invasive plants through the Minnesota Noxious Weed Law (State Statutes 18.75-18.91 and 160.23). Enforcement of the Noxious Weed Law is the shared responsibility of Counties, Cities, and Townships. Noxious weeds are classified as prohibited, restricted, or specially regulated depending on the level of regulation and allowable uses for each species:

State Prohibited Noxious Weeds are separated into two regulatory listings - eradicate and control. Plants in the eradicate list are not widely established in Minnesota but must be eradicated if found. Plants in the control list are established in Minnesota and must be controlled to prevent further spread and maturation. For both listings, propagation, sale, or transportation of these plants is prohibited.

Restricted Noxious Weeds are widely distributed in Minnesota and the only feasible means of control is to prevent their spread by prohibiting the importation, sale, and transportation in the state. Restricted Noxious Weeds are not required to be controlled or eradicated by law, but management is strongly encouraged to reduce the spread to new areas.

Specially Regulated Plants may have demonstrated economic value and be sold commercially but have the potential to cause harm in non-controlled environments. The MDA define the use and management requirements for each plant.

The following species of noxious weeds are found in and around the City of White Bear Lake. Most of these species were originally brought to North America at the time of European Settlement in the mid-1800's to the early 1900's.

Spotted Knapweed (*Centaurea stoebe*)

Classification: State Prohibited Noxious Weed - Control

Spotted Knapweed is native to Europe and Asia. It prefers dry soils and is commonly found in natural areas and along roads, rail lines, and trails. The plant produces a chemical that is toxic to other plants, allowing it to spread quickly. Small patches of Spotted Knapweed can be managed by hand-pulling and digging. Gloves and long sleeves must be worn when handling this plant.

Leafy Spurge (*Euphorbia esula*)

Classification: State Prohibited Noxious Weed - Control

Leafy Spurge is native to Eurasia and invades prairies, grasslands, and roadsides. The plants spreads aggressively by seed and extensive underground roots. Herbicide applications in the early spring and fall can effectively reduce Leafy Spurge populations. Biological control is also an option to control larger infestations.

Garlic Mustard (*Alliaria petiolate*)

Classification: Restricted Noxious Weed

Garlic Mustard is an aggressive biennial herbaceous plant, which means it grows as a rosette in its first year, it flowers in its second year and then it dies. It grows in a way that crowd out native wildflowers, tree seedlings, and woodland plants and can totally dominate a woodland area within five to seven years. Garlic mustard can be managed by pulling up the second years plans before they flower and produce seed, typically in early spring. Even though it is a prolific seed producer, garlic mustard can be managed by preventing seed production of plants over several years. Managing this species takes a strong commitment once it becomes established. Garlic mustard rosettes can be spot treated in the fall when many native plants are dormant. Flowering garlic mustard plants can be treated with herbicides or hand pulled.

Because flowing garlic mustard can spread seed even after it's been pulled up by the roots, the Minnesota Department of Agriculture (MDA) recommends that plants be placed in bags for disposal and not simply left on the ground where they were picked. The bagged plants can be kept on site for burning or piled and covered with a tarp for decay. Be sure to monitor the site and remove any plants that sprout from the burn or decay site. If plants must be moved off site, contact your local yard waste or compost site to see if they are equipped to compost at high enough temperatures to accept noxious weeds at their site. Transportation is only allowed to a disposal site and the MDA requires the load is protected in a manner that prevents the spread of noxious weed propagating parts during transport. It is illegal in Minnesota to dispose plants in a landfill. See the MDA Noxious weed disposal website for additional information.

Crown Vetch (*Securigera varia*)

Classification: Restricted Noxious Weed

Crown Vetch is groundcover that is native to central and Eastern Europe. It was introduced to the U.S. in the mid 1800's, and by the 1950's was widely planted along roadways and waterways as a slope stabilizer. Crown Vetch spreads by seed and rhizomes and forms a dense monoculture in prairies, streambanks and along roadsides. Once established, Crown Vetch is difficult to control and may need to be treated for several years. Treatment options include mowing, prescribed burns, and foliar herbicide. Crown Vetch has been identified on City property along Heiner's Pond.

Buckthorn

Classification: Restricted Noxious Weed

Buckthorn is a non-native shrub brought over from Europe in the mid-1800s for use as a landscape hedge or windbreak plant. It forms dense thickets in wooded areas and will out-compete native shrubs, tree seedlings, and perennials such as wildflowers for sunlight, water, and soil nutrients. Buckthorn was classified as a restricted noxious weed in 2001 and can't be purchased in Minnesota.

Common buckthorn (*Rhamnus cathartica*) and **Glossy Buckthorn (*Rhamnus frangula*)** are the two species of interest. They can be easily identified because they leaf out earlier in the spring than most native plants and retain green leaves well into November. Control may take several years and usually cannot be done in a single season. The most effective time for buckthorn removal and control is late summer through fall. Proper identification is important so that native shrubs, such as American plum, chokecherry, or grey dogwood, are not removed by mistake.

Priority should be given to removing female berry-producing plants. This can be done by cutting plants close to the base and treating with glyphosate or covering stumps for 1 to 2 years with cans or thick black bags to keep sunlight out. A weed wrench is helpful for larger plants. Buckthorn may be taken to Ramsey County yard waste collection sites.

Buckthorn has been identified in Hidden Hollow Park, Lakewood Hills Park, Rotary Nature Preserve, Matoska Park, and on City property along the east edge of Heiner's Pond.

Tartarian Honeysuckle (*Lonicera tatarica*)

Classification: Restricted Noxious Weed

Tartarian Honeysuckle is a shrub native to Eastern Asia that was brought to the U.S. in the 1700's as an ornamental plant. It spreads by seed dispersal and has naturalized in woodlands, roadsides, and meadows throughout Minnesota.

Giant Knotweed (*Reynoutria sachalinensis*)

Classification: Specially Regulated Plant

Giant Knotweed is a perennial shrub native to Asia that was imported to North America in the late 1800's as an ornamental plant. The plant escaped cultivation and can be found growing along streambanks and riparian habitats. Infestation generally occurs through the transport of root fragments in streams or from soil movement. Knotweed spreads aggressively by underground rhizomes and forms dense thickets that displaces native vegetation. It is still sold commercially but a label must be affixed to the plant container indicating that it is inadvisable to plant this species within 100 feet of a waterbody or floodplain. Japanese Knotweed is a smaller, related species that is also on the Specially Regulated Plant list. Knotweed is found on the shoreline of Heiner's Pond, White Bear Lake, and Willow Creek Wetland. Because of its preferred habitat near waterbodies, goals and implementation items for the control of Knotweed on City property is addressed in the City's Surface Water Management Plan.

Amur Maple (*Acer ginnala*)

Classification: Specially Regulated Plant

Amur Maple is a small tree native to central and northern China, Manchuria, and Japan. The tree seeds prolifically and is becoming invasive in open wooded areas where it displaces native shrubs and understory trees. It is still sold commercially and is widely planted as an ornamental tree due to its brilliant red fall color. Amur Maple is classified as a Specially Regulated Plant, requiring sellers to affix a label that advises buyers to only plant Amur Maple in landscapes where the seedlings will be controlled by mowing or other mean. Amur Maple should be planted at least 100 yards from natural areas.

Amur Maple can be controlled by cutting the stump and treating with glyphosate or bark treatment around the stem with tricopyr. Amur Maple has been identified in Rotary Park.

European Common Reed (*Phragmites australis*)

European common reed can form dense stands that displace native common reed and other wetland plant species, reduce habitat quality for fish and wildlife, and alter ecosystem functioning and hydrology. European common reed is a "cryptic invader" in Minnesota since the native subspecies is widespread throughout the state and the non-native subspecies is easily confused with it.

TERRESTRIAL INVASIVE ANIMALS-INSECTS

The Minnesota Department of Agriculture regulates the introduction and spread of invasive insects through the State Plant Pest Act (Minnesota Statutes Chapter 18G and Chapter 18J).

Emerald Ash Borer (EAB)

EAB is an invasive forest beetle from Asia which attacks all types of ash trees. Woodpeckers readily feed on EAB larvae and leave evidence of such (called "flecking") as they remove the outer bark. Feeding larvae create tunnels in the bark and emerging adult beetles chew 1/8-inch, D-shaped exit holes. Once trees begin to show these signs and symptoms of EAB, they generally die within one to three years.

Ash trees make up as much as 60% of the tree species in some communities. Homeowners should consider removing and replacing ash trees, or may try to save ash using preventative insecticide treatments. Insecticides are less costly than removal, but require treatment on a semi-annual basis. It is recommended to fully research the impacts of treatment options or consult with a certified arborist prior to application.

The City has mapped the Ash trees on the manicured public property but has not yet surveyed the naturalized areas. Of the 356 Ash trees found so far, approximately 125 have been identified as specimen trees which are candidates for treatment versus removal. Emerald Ash Borer has been found on the south side of the City and staff is currently in the process of formulating a plan of action.

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