NATURAL RESOURCE PROTECTION & CONSERVATION

Naturals resources are considered at two levels in this Plan: a landscape scale, and a site/resource specific scale. Each is discussed in this section.

At a landscape scale, approximately 51% of South Burlington is conserved in some form: publicly, privately, or through current regulation. Approximately 41% of South Burlington is considered a "built" area – meaning the lot is small or has at least one development/improvement like a home, commercial building, parking lot, other structure, or supporting infrastructure[1]. The remaining approximately 8% is a mix of types of land, including unbuilt residential lots, open farmland, shrubland, forests, and unbuilt commercial lots that are not presently restricted or regulated.

Open lands have value at least in part because they are currently open or unbuilt. It matters less if the ecological community is currently managed grassland, maintained farmland, shrubland, or forest than the fact that it is currently unbuilt. However, all open land does not have to be earmarked for conservation. Some sites in our currently built areas should be built while others will need to be conserved and used as park space. Some sites in our currently unbuilt areas should remain unbuilt, especially if they provide habitat connectivity, while others, especially neighboring transit lines and other development, may be suitable for development.

At a resource / site scale, the City is home to several brooks & streams, floodplain areas, wetland complexes and their buffers, shoreland to Lake Champlain and the Winooski River, certain potentially hazardous areas including steeps slopes and river corridors, and a series of habitat blocks that have been identified and mapped. These natural resources with value regardless of their context have largely been regulatorily conserved. These resources are generally described as "primary conservation" resources in the 2014 Open Space Report; this category also includes the above-noted identified habitat blocks. To support the viability and effectiveness of these resources, practical and ecologically-beneficial connections between them are also prioritized for protection at some level.

A third category of land use to complement the above are working lands. In South Burlington, where they exist, these consist primarily of farmland and hayfields, but also includes in limited forms managed forest lands and fruit tree orchards. Working lands have been a significant part of the City's landscape for the past 200 years. In addition to a series of operating farms, discussed below, the historic use of this land has shaped the location of current and evolving habitat blocks, viewsheds, and land use patterns.

Landscape & Background

South Burlington's existing landscape has been heavily influenced by its history of glaciation and erosion from the Appalachian Mountains. This has given South Burlington its distinct topography and geological features. Air quality in South Burlington has varied over the 20th century, but efforts to reduce pollution have resulted in generally stable, high-quality air. South Burlington has an established climate with low winter temperatures, moderate summer temperatures, and relatively high humidity, but that climate is now changing.

[1] Calculated as lots less than 4 acres in size, plus lots over 4 acres in size that have at least 10% impervious surfaces such as buildings, parking lots, driveways, etc.

Air Quality. Air quality in Chittenden County currently meets all basic federal health (attainment) criteria. The primary sources of airborne pollutants include automobiles and trucks, industry, and residential/commercial heating. The community must continue to maintain or improve air quality conditions, including through promotion of electric vehicles and non-fossil-fuel building heating sources.

Topography. South Burlington's landscape includes a series of ridgelines and river valleys. Five prominent north-south ridgelines shape the City's landscape and play an important role in the historic transportation, settlement, and wildlife transit patterns of the community, and provide spectacular views. North of these ridge systems is a flat, well-drained deltaic deposit. This flat area is drained by a network of drainage ways towards Potash Brook to the south and tributaries of the Winooski River to the north. City Center and Burlington International Airport are located in this area.

On a micro-scale, there are also limited areas of locally-steep slopes, primarily associated with water bodies, but there are more isolated cliffs and very steep slopes on specific sites. There are also some defunct quarries, including on Spear Street south of I-189.

Geology. Shallow depth to bedrock and location of bedrock outcrops (due to the glacial history of the area) dictate the location of roads and underground utilities, and restricts location of building foundations. While most of the City is served by water and sewer service and most remaining areas are designated conservation areas, on a site-by-site basis groundwater recharge areas into our bedrock aquifers should be considered when development is regulated or reviewed.

Climate and Climate Change. The region's existing variable climate burdens natural communities with the wide temperature range. Winter conditions require snow storage on all properties, and demands regular plowing services by the City. Rainfall must be accounted for to ensure stormwater runoff does not negatively affect water quality or stream bank erosion.

Climate change poses significant challenges for all communities, both in how they contribute to the change, and how they respond to it. The City of South Burlington has substantial opportunities to address both by fostering land use patterns, transportation modes, and energy strategies that can temper the City's carbon footprint. Goals and strategies related to this issue are found through the plan under relevant chapters. Climate change is also affecting how waterways and ecosystems operate, and how the City will need to adapt, via infrastructure updates, land use policy & regulation, public lands management, and operations.

Resource Extraction

Minimal resource extraction currently occurs in South Burlington and new operations are not expected. There are several defunct quarry/gravel pit sites scattered throughout the City on both public and private lands, which generally have little impact on current land use.

OBJECTIVES

INVENTORY, ANALYSIS, & CHALLENGES

Mineral Extraction. South Burlington is currently home to two quarries: an active quarry near Meadowlands Business Park, accessed through Williston; and an inactive quarry at the south end of the airport property. The location of the active quarry/gravel pit near the interstate, conservation areas, and existing development requires careful management and access through Williston remains the most appropriate route. It is possible that the active quarry, which opened to serve the construction of I-89, will reach the end of its useful life in the coming decades. When that occurs, mitigation will be required and should be planned for. New quarries or other mineral extraction is not expected.

Quarrying and production of gravel also occurs on large development sites to serve the construction of the development. These activities are generally very localized and short-lived for the duration of construction. At the end of construction, these areas must also be properly mitigated.

Working Lands

South Burlington has a long history of working lands, primarily for agriculture, but also for limited forestry. Since WWII, land use has shifted away from agriculture to residential and commercial (non-agricultural) development. Maintaining the working character of some of South Burlington's lands supports a vibrant community through support of local agriculture, value-added agricultural products, and community events.

OBJECTIVES

INVENTORY, ANALYSIS, & CHALLENGES

Forestry

South Burlington's existing development patterns, land value, and limited remaining contiguous forest means commercial forestry is extremely limited. While the opportunity for forestry is limited, the City supports ecologically-oriented forestry operations. However, pursuant to VSA 24 Chapter 117, accepted silviculture practices are exempt from local zoning. New commercial-scale forestry is not expected.

Agriculture

The City of South Burlington is a largely urbanized community with a small number of traditional farm parcels remaining. Creative forms of agriculture, including small vegetable farms, Community Supported Agriculture (CSA) programs, and agritourism ventures, have become part of the City's economic and cultural base. Agricultural production in South Burlington faces several economic obstacles, including the cost of open land, conflict between agricultural uses and residential areas, and limited available land. To promote small-scale and creative agriculture, the City will need to continue to evolve and adapt, balancing the positive and negative impacts for its residents, and will need to continue to provide a role in supporting agricultural lands.

Commercial- & Institutional-Scale Agriculture. Currently, four relatively large agricultural operations exist in South Burlington. UVM owns significant agricultural land in South Burlington, including its Miller Complex dairy farm on Spear Street and the Horticultural Farm on Shelburne Road, and supporting lands along Spear Street. Bread & Butter Farm operates currently on Cheesefactory Road and has recently worked with Vermont Land Trust and the City of South Burlington to conserve the former Auclair Farm

lands near Cheesefactory Road and Hinesburg Road primarily for agricultural use. Common Roots is a smaller operation in South Village, Hubbard Park, and Wheeler Nature Park. Belter Farm is a dairy farm located on Country Club Drive working on lands primarily in the Winooski River floodplain.

Support to relatively large farm operations supports local food, open space, and a community hub, which contributes to a vibrant local community and economy. The City has invested funds into the conservation of agricultural lands currently farmed by Bread & Butter Farm (the former Leduc Farm) and being acquired through the efforts of Bread & Butter Farm (the Auclair Farm). The City also leases part of Hubbard Park and Wheeler Nature Park to Common Roots at low rates. The City should continue to seek out and support the long-term agriculture ventures that meet City goals for environmental stewardship, regenerative practices, and sustainable agriculture.

Smaller commercial opportunities do exist for smaller-scale agriculture throughout the city and a few small operations have sprung up over recent years, but more space does exist for new ventures. The City should continue to support community-scale farms to exist and to support value-added products, agritourism, community events, and educational opportunities.

Community Gardens. At present, there are two sets of public community gardens in the City; one on land owned by the University of Vermont at the corner of Swift and Spear Streets, the other which is owned and operated at the Wheeler Nature Park Homestead on Dorset Street. Both of these have waiting lists. The existing gardens are located in the Southeast Quadrant and are difficult to access without a personal vehicle. Many small private community gardens do exist and developing these is an option for open space in new developments. Promotion of public community gardens also recognizes the needs of our diverse community of New Americans who may have a tradition of gardening but may not have access to garden space at their residence.

Soils. Most of the soils in South Burlington are classified as prime soils or soils of statewide important for agriculture by the federal Natural Resource Conservation Service (NRCS). Historically, these soils have been beneficial to both agricultural operations and development. Today, the City must balance small- and mid-sized agricultural opportunities with demands for affordable housing and economic development. Of the soils of statewide importance, very little is prime agricultural soil. For that reason, the City should explore how to avoid developing unbuilt prime agricultural soils for uses other than agriculture.

Ecological Resources

South Burlington has a varied landscape from Lake Champlain, its watershed and associated wetlands to geological features ranging from lakeside cliffs to sandy soils. The City protects ecological resources for many purposes, including natural open space, wildlife habitat, stormwater management, agricultural benefit, and climate-change mitigation.

OBJECTIVES

INVENTORY, ANALYSIS, & CHALLENGES

Vegetation. Trees, shrubs, and other soil cover prevent erosion, provide stormwater benefits, improve air quality, provide visual and aural buffers, and furnish shade and protection from wind. We must continue to work to remove non-native invasive species, promote vegetative biodiversity, and incorporate pollinator species into landscaping.

Due to South Burlington's geology, climate, elevation, and agricultural history, the forests are primarily deciduous forest. Because of that context, much of the forest is located in localized blocks with limited interconnection. Many forested blocks have now been protected as "habitat blocks" and development is extremely limited. The City will work to maintain these localized blocks as identified habitat blocks and promote appropriate forest management, education, and expansion of interconnection options.

The planting of street trees can serve to provide a safer and more pleasant pedestrian experience, calm traffic flow, and contribute to urban beauty, air and water quality, and noise reduction. Street trees have value to the City's residents and visitors more for their ability to prevent the heat island effect, provide shade. Generally, they do not provide significant habitat, but their other benefits dictate that the City should continue to promote trees in street landscaping. This includes burying power lines where possible.

Both forests and street trees contribute to a healthy and varied tree canopy. Maintaining a healthy tree canopy supports our public health, energy conservation, water filtration, absorption of air pollutants, improved wildlife habitat, recreational enjoyment, aesthetic relief, and noise reduction. Conservation of mature and specimen trees is important and must be balanced with ensuring conserved natural areas have diversity in tree ages and species, to protect from the impact of species-specific diseases and other die-off events. The City should minimize trees removed from development sites and promote planting of replacement or additional mature trees in new development or redevelopment areas.

Due to significant amounts of single-family residential development, South Burlington is also home to extensive lawn area and residential landscaping. Small residential lots provide private open space but also can be problematic if not managed properly. The City has an opportunity to promote healthy management practices like pollinator-supporting species, reductions in pesticide and herbicide use, and participation in No-Mow May and Raise the Blade campaigns for lawn maintenance.

Wildlife. South Burlington residents share the densely populated urban and suburban areas and open spaces with a diverse population of wildlife. Past studies have identified travel routes - or corridors - most often frequented by larger wildlife, primarily in streams, wetlands, bogs, and undeveloped forest blocks. Maintenance of ecological resources and a varied landscape, including steep slopes, shallow soils, and extensive bedrock outcroppings is important to support varied wildlife habitat. The current characteristics of the wildlife habitat areas South Burlington, including the size of habitat areas, connection between them, and type of vegetation dictates that we must be targeting relatively small mammal species like bobcat, red and grey fox, white-tailed deer, river otter and fisher.

Natural communities continue into our neighboring municipalities. Coordination with neighboring jurisdictions and regional and state entities is critical.

Surface and Ground Water Resources

Protection of our surface and groundwater resources is critical for both the drinking water needs of City residents and for climate-change mitigation. With regulatory changes in recent years, the City has taken significant steps to expand protections for these resources, both for environmental and property loss prevention reasons. Our standards generally exceed those imposed at the State level and protect our natural landscapes and the water quality in our drinking water source, Lake Champlain.

OBJECTIVES

INVENTORY, ANALYSIS, & CHALLENGES

Watersheds. Seven main watersheds exist within the City of South Burlington: Potash Brook, Muddy Brook, Bartlett Brook, Centennial Brook, Englesby Brook, Winooski River, and Lake Champlain. The flows from all of the surface and groundwater systems in the City eventually reach Lake Champlain. Most of these watersheds are stormwater impairment for water quality primarily due to impervious surface runoff. The City must continue to evaluate its own practices, continue expanding and improving the stormwater utility's projects, and strive to meet state and federal water quality goals in these watersheds.

Wetlands. Class II and III wetlands throughout South Burlington serve as stormwater storage, control the flow of streams, filter sediments and surface runoff, and provide habitat for fish and wildlife. Wetlands cannot be replaced once they have been disturbed by mowing, fertilizers, or pesticides. Incremental reduction of minor wetlands can cause cumulative damage to the wetland's function and values. Protection of wetlands and buffer areas around wetlands can prevent damage and loss of the ecological and environmental benefits.

Floodplains & River Corridors. South Burlington must plan for greater frequency and intensity of flooding events with climate change. Floodplains are categorized based on the projected frequency of flooding, i.e. the 100-year floodplain will flood, on average, every 100 years. However, because of the changing nature of storm events, South Burlington has chosen to regulate building in the 500-year floodplain as the possible equivalent of the future 100-year floodplain.

River Corridors. River corridors include the area adjacent to a river channel where fluvial erosion, channel shape change, and channel meandering are most likely to occur. River corridors are specifically defined by the State of Vermont Department of Environmental Conservation.

Stream Channels and Riparian Buffers. Stream channels serve as habitat for fish and wildlife, as natural flood control features, and provide an attractive environment. Alterations to rivers, streams and tributaries can often have unexpected downstream effects, including physical changes like straightening, rip-rapping banks, and dredging sediment, changes in land use, and adding impervious area.

The City has natural buffer requirements around perennial streams and brooks. This strategy does not take into account changes in stream course over time. The City and Vermont Agency of Natural Resources have completed geomorphologic assessments of the City's various stream segments. The City

could develop more advanced stream channel protection standards or other strategies in response to the identified risk.

The City also has a stormwater utility that manages stormwater in a cost-effective way and undertakes large-scale stormwater treatment and flow control projects. For more information, see the Water section.

Lake Champlain. South Burlington has 2.3 miles of frontage along Lake Champlain, a unique scenic and recreational resource that is widely used by both residents and visitors nearly year-round. The lake is the City's potable water supply through the Champlain Water District and some private water intakes. See the Water section for more information.

Aquifers & Wells. Groundwater is a source of potable water for a limited number of City residents on private wells or connected to the Fire District #1 water supply in Queen City Park. Contamination of groundwater with road salt, hydrocarbons, pesticides, and fertilizer can pose health issues or other water quality problems. South Burlington must consider the location of groundwater aquifer recharge areas when planning for future land use.

Flood Resiliency. The City of South Burlington All Hazards Mitigation Plan (AHMP) developed in conjunction with the Chittenden County Regional Planning Commission (adopted in 2011, updated in 2016 and 2022) identifies the most significant flooding hazards. This plan should be reviewed often to ensure accuracy and that all hazards are being adequately addressed. The mitigation strategies identified in the most recent All Hazards Mitigation Plan should all be adopted by reference as strategies in this Plan.

South Burlington protects from flood hazards through zoning regulations which limit development and fill in floodplains. Restricting development on floodplains and river corridors also maintains natural open spaces and could allow development of needed recreation areas. The largest designated floodplain lies adjacent to the Winooski River.

The City has and is continuing to take a proactive stance in regulating floodplains. Comparatively little development exists within the City's 100-year floodplain, and it remains the City's policy to prevent new development there. Looking forward, the City is envisioning greater frequency in flooding in areas presently mapped as 500-year floodplain, and in the future anticipate new areas being added to one or both designations. Proactive planning for these areas will forestall future challenges.

A key component to achieving flood resiliency is a comprehensive approach to stormwater management. See Stormwater section for more information.

Water Quality. Water pollution comes from point sources and non-point sources. Point sources, such as wastewater treatment facilities, are much less of an issue today than non-point sources, which occurs throughout a watershed and includes stormwater runoff, agricultural runoff, and pesticide use. Pesticide use is governed by the State, the City restricts the use of fertilizers and pesticides on City property. See also Stormwater section for more information about stormwater runoff.