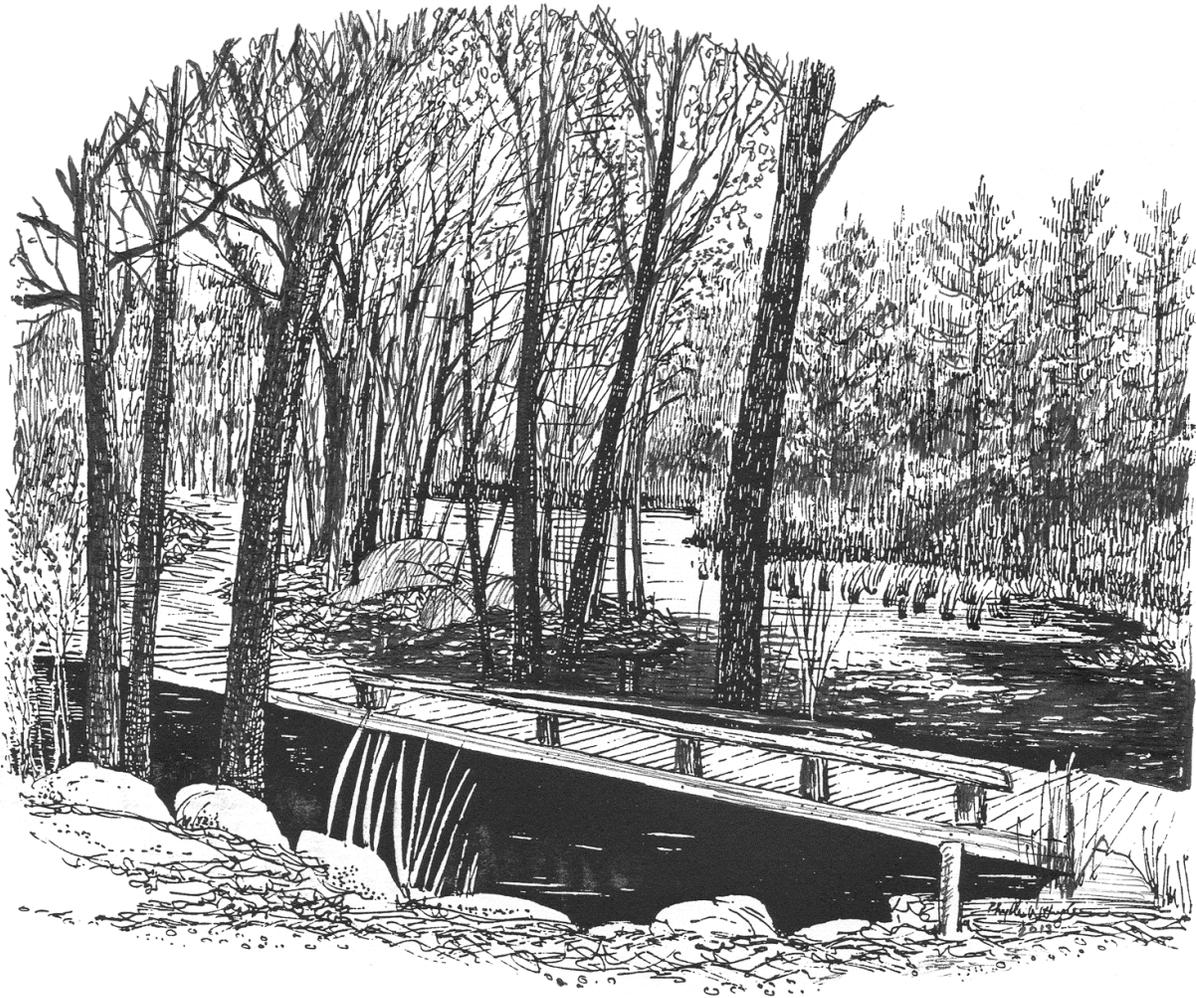


# Town of Carlisle Open Space and Recreation Plan 2020/2021

Carlisle, Massachusetts

1 November 2020

Approved through March 2028



2020 Open Space and Recreation Plan Committee

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Finally, the Committee acknowledges the contributions of Carlisle citizens, past and present, who have provided a legacy of conservation and recreation lands for our enjoyment and stewardship.

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*Note: All maps and data in this report are approximate or subject to error.  
Please refer to official information on file in Carlisle Town Hall.*

# Open Space and Recreation Plan 2020/2021

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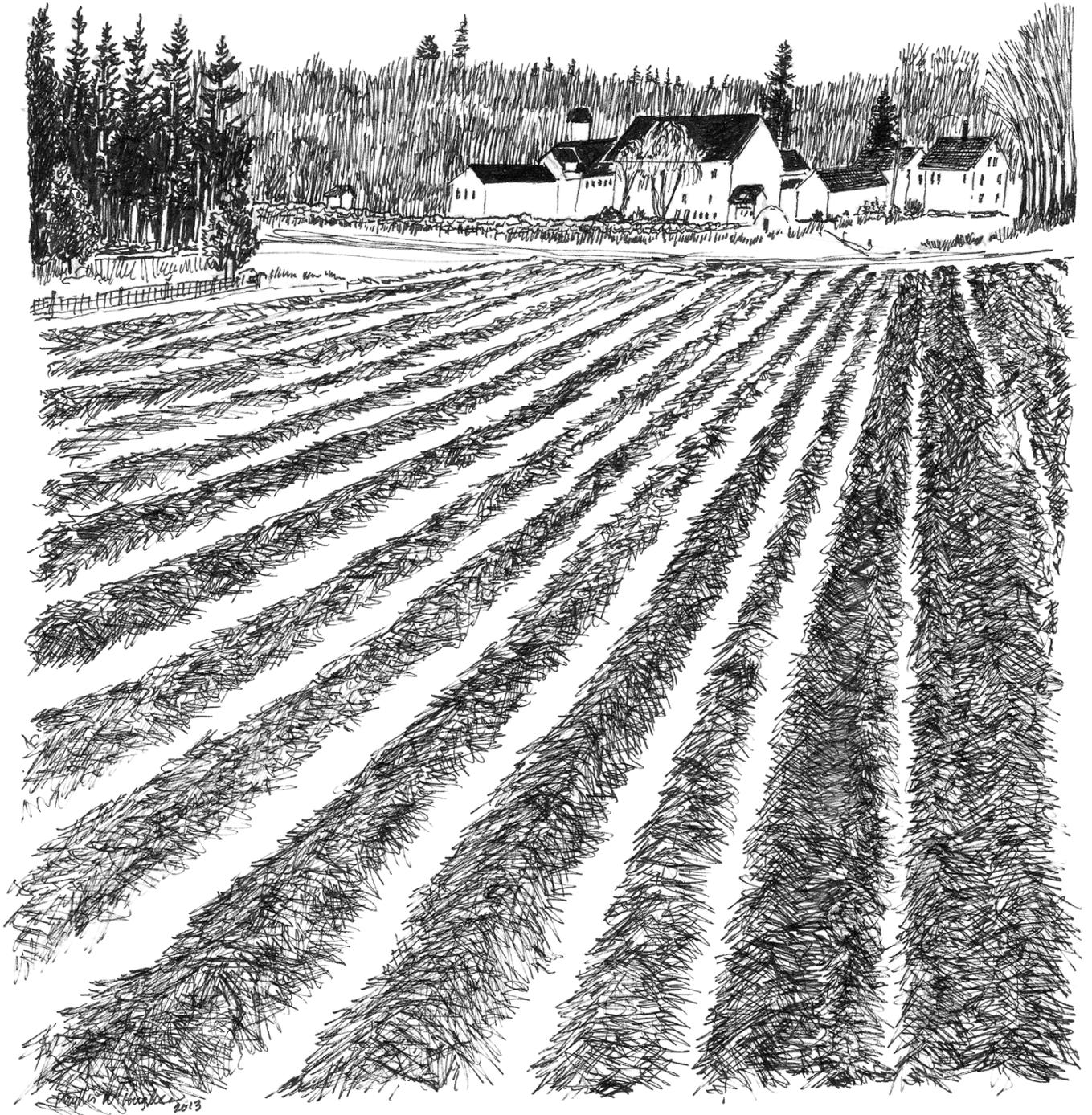
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## Section 1: Plan Summary



*Viewed across a plowed field from School Street, historic Clark Farm, with the farmstead dating as far back as 1742, was owned over the centuries by notable Carlisleans, including the Blood, Spaulding, Green, Wilkins, Nickles, and Carr families, and was acquired by the Clark family in 1899. After the passings of Guy and Dot Clark, the farm was purchased, the farmhouse and historic barn were renovated, and Clark Farm today remains a working farm, operating as a CSA.*

## Section 1: Plan Summary

Carlisle was historically a farming community and is now a small bedroom community consisting of 9,913 acres (15.4 sq. miles) located 18 miles northwest of Boston and 8 miles southeast of Lowell. More than sixty years of two-acre zoning, the lack of a public water system or sewage service, and a wealth of conservation land have together helped maintain the highly valued rural appearance of the town. Low-density housing, with a few denser developments surrounded by open space, combined with significant remaining undeveloped land, disperses Carlisle's 5,300 citizens for an average population density of about 346 persons per square mile. Carlisle has permanently protected approximately 3,488 acres, or about 35%, of its undeveloped land. Overseers of this protected open space include the Carlisle Conservation Commission, the Carlisle Conservation Foundation, The Trustees of Reservations, Sudbury Valley Trustees, Harvard University, the New England Forestry Foundation, the Commonwealth of Massachusetts, and the federal government. Private citizens, usually through donations or bargain sales, have contributed approximately 700 acres (an increase of 12% since 2013) of Carlisle's open space by means of permanent conservation restrictions (CRs) on their properties.

Carlisle enjoys a long history of publicly supported efforts to preserve its rural appearance and protect natural resources and wildlife habitat. Over the years since the early 1970s, various study groups and surveys have ranked saving Carlisle's small-town rural character and extensive open spaces as the highest value worth preserving in contemplating the town's future. Recent outreach as part of the ongoing Master Planning process has reaffirmed this overarching goal and has shown citizen support for expanded facilities for active recreation and community activities.

In addition to a wealth of open space for passive recreation such as walking on the extensive trail system and nature study (and more active uses of open space such as the Community Gardens), Carlisle residents also enjoy a variety of active recreation facilities including playing fields, tennis and pickleball courts, playgrounds, a fitness course, a beach volleyball area, and a running track. The town provides a riding ring on public property, supplementing trails and private facilities for horseback riding. The cross-country skiing concession at Great Brook Farm State Park (GBFSP) is an important resource for residents and attracts skiers from the surrounding area. Trails in GBFSP and Carlisle roads are also popular among bicyclists.

The 2020/2021 Open Space and Recreation Plan (OS&RP) includes an inventory of lands of conservation and recreation interest, including Town-owned, Commonwealth-owned, federally owned, and privately owned protected land; lands and facilities used for active recreation; publicly owned unprotected land; and a priority ranking of privately owned unprotected parcels. The most important open space protections of the past five years are the acquisition of 6 acres of the highly-ranked Woodward property, with another 32 acres of the land anticipated to be deeded to the town for Open Space as part of the permitted, but not yet built, Residential Open Space Community development off Bedford Road; the 22 acres of the highly-ranked Talbot property deeded to the town as part of the Senior Residential Open Space development off Russell Street; and three CRs on more than 60 acres of three farms: Woodhaven Farm to the south, Sorli Farm to the west, and Black Brook Farm to the north.

Looking to the future, the 2020/2021 OS&RP states the need to preserve additional open space for groundwater protection, conservation, and recreation. There are concerns about groundwater quality and quantity as virtually all residential development requires on-site drinking water wells and septic systems. Acquisitions of land for conservation will enhance the conservation value of already protected land, and the additional land will improve and expand both wildlife corridors and links between walking trails.

The Plan states the need for ongoing maintenance of existing open space, with land stewardship receiving increased attention within both town government and local conservation groups. Good stewardship includes the development of baseline assessments and management plans, improved signage, and efforts to monitor and control invasive plants. Stewardship may also include establishment and maintenance of wildflower meadows to support native pollinators.

The Plan also encourages the support of agricultural efforts by local farmers in order to save what remains of Carlisle's farming tradition, which also helps keep land from residential development, thus protecting natural resources.

To address the increased demands of a diverse and aging population, this Plan supports the short-term and long-term goals articulated by the Recreation Commission to refurbish Spalding Field and explore the feasibility of an artificial turf field, which will allow more uses than a natural turf field, thus minimizing overuse of the fields at Banta-Davis, and to consider the development of a multigenerational Community/Recreation Center on the Moseley Land. The latter is also an important goal of the Council on Aging.

Several decades of slower residential growth and a substantial reduction in the number of students in Carlisle Schools has raised some concerns about maintaining town services in an efficient manner without unduly increasing the tax burden on residents. This concern is quite a change from the concerns of only a decade ago, when projected population growth was expected to necessitate commensurate growth of the infrastructure and the attendant increase in taxes. In the current economic climate, Carlisle's leaders are mindful of the limited financial resources for acquisition of additional municipal land, whether for recreation facilities, open space, or affordable housing. Cluster developments are a cost-effective means of preserving open space and should continue to be promoted. Denser developments reduce sprawl, which means less disturbance of the land. In exchange for the increased density, they require some land be set aside as open space. Thus, the Town gains open space at no cost and increases its residential tax base.

An important part of the planning process has been the Americans with Disabilities Act (ADA) Access Self-Evaluation of public lands and facilities. Buildings and facilities for public use are limited in Carlisle. It is a small community and efficiently uses its publicly accessible buildings for many purposes. Carlisle has made many improvements to make the town more accessible and more walkable, including the development of a pedestrian pathway system radiating from the Town Center, accessible pathways created in conjunction with residential developments in several locations around town, and ADA-compliant crosswalks in the Town Center. Additional work needs to be done to improve the accessibility of parking and signage at recreation and open space properties and to survey existing trails to determine which can be made more accessible to people with disabilities.

Recognizing Carlisle’s community vision and its needs in the areas of conservation and recreation, this Plan includes objectives that will help to meet four primary goals.

Goal 1: Maintain the rural character of Carlisle.

Goal 2: Protect the town’s environment.

Goal 3: Meet the town’s recreational needs.

Goal 4: Proactively manage land use in town.

In order to address each of these goals, 20 Town boards and interested groups developed their seven-year action plans, or initiatives, for 2020 through 2027. From these, the OS&RP Committee identified a list of high-priority initiatives including the Spalding Field and Community/Recreation Center projects noted above; building a fenced-in dog park; extending the pathway system; improving trail connections within town, to neighboring communities, and to regional trail networks; supporting active agriculture in town; increasing access for persons with disabilities; repairing the Greenough Dam; determining a future use for the Cranberry Bog Land; and restoring the Central Burying Ground. An important town-wide initiative is the critical, ongoing effort to safeguard the quality and quantity of our water supply.

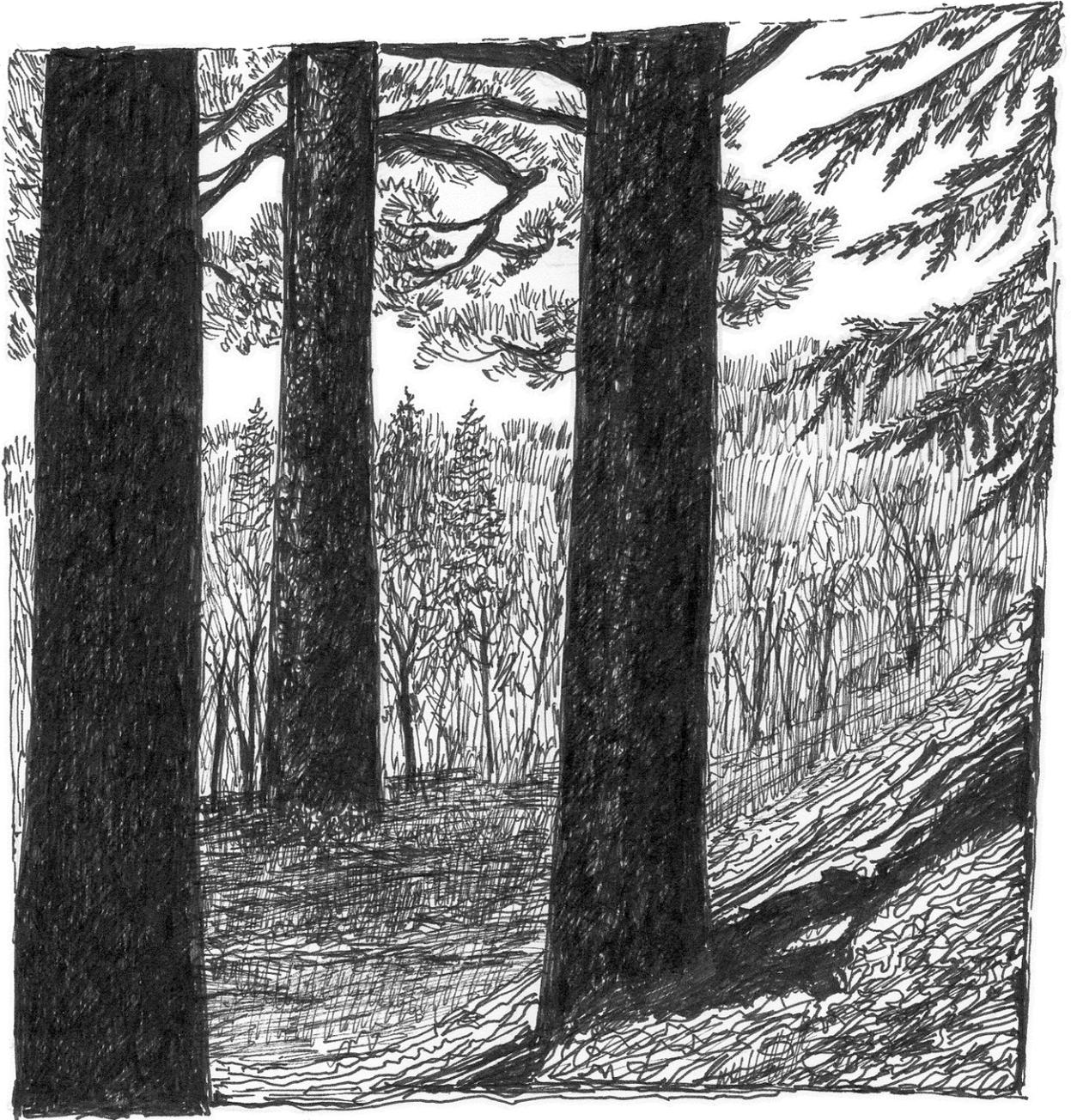
The Plan is enhanced by detailed full-color maps of Carlisle highlighting key features, including placing Carlisle in the context of its neighboring communities. As residential development continues to expand into unprotected areas in the towns around us, the preserved woodlands, open spaces, and active agricultural land in Carlisle may become an even more important regional resource. Even with more than a third of our land area permanently preserved, more than 50 miles of trails, and a smattering of active agricultural operations, additional preservation of land in Carlisle should remain a priority.

Carlisle also needs to consider its place in the broader global community and expand efforts to reduce its carbon footprint. Starting with its designation as a Green Community almost a decade ago, Carlisle has implemented energy efficiencies in municipal buildings, has had solar photovoltaic canopies installed above the school parking lot, and encouraged residents to be more energy efficient by arranging for the provision of 100% renewable energy sources as the default option for residential electric service. Further progress towards sustainability will require the efforts of the entire community. Local protection of additional open space, one of the core goals of this OS&RP, helps mitigate many of the damaging effects of climate change.

Finally, this Plan includes an updated and expanded compilation of Carlisle’s biota. A dedicated group of volunteer biological experts and amateur naturalists spent countless hours walking fields and forests, uplands and wetlands, to locate, photograph, and otherwise document the Town’s flora and fauna. The hope is that this information will become part of a growing database and website for the Town and that this database will prove useful in future years for studies of the effects of climate change on our natural environment.

## Section 2: Introduction

- A. Statement of Purpose
- B. Planning Process and Public Participation



*Carlisle Pines State Forest, owned by the Commonwealth and managed by the staff of Great Brook Farm State Park, is home to some old growth white pines and hemlocks that may date to before the Revolutionary War.*

## Section 2: Introduction

### A. Statement of Purpose

#### Purpose of the Plan

The 2020/2021 Open Space and Recreation Plan (OS&RP) has been developed to help Carlisle identify its current resources, both physical and cultural, and its goals in the areas of open space, conservation, and active and passive outdoor recreation.

Carlisle prepared an OS&RP in 1979 and again in 1987, under the direction of Kay Kulmala. In 1994, the plan was revised according to the Commonwealth's 1991 requirements for OS&RPs; this plan was revised again in 2000. In 2005, the plan was revised according to the Commonwealth's 2001 requirements; in 2010 Carlisle took advantage of the opportunity for a 2-year extension on its plan by updating the 2005 OS&RP Five-year Action Plan. The 2013 plan was revised to meet the requirements set out in the Commonwealth's 2008 "Open Space and Recreation Planner's Workbook." Because the Workbook has not been updated since 2008, the current plan follows the same format as the 2013 plan.

#### Accomplishments from 2013 through October 2020

Carlisle continues to make significant progress in its efforts to protect open space permanently, thus providing active and passive recreational facilities for its own residents and for visitors. As of October 2020, approximately 3,488 acres of natural space have been protected in Carlisle, an increase of 126 acres since the 2013 OS&RP. Protected open space makes up approximately 35% of Carlisle's total acreage of 9,913 acres. This progress is evidenced in the following discussions of 1) Land Acquisition, 2) Land Protection, 3) Land Management, 4) Land Use, and 5) Legal Issues.

### 1. Land Acquisition

The past 7 years have seen the preservation of a few large properties through conservation restrictions (CRs), a few parcels received in relation to residential developments, and a small outright acquisition that will lead to the protection of significant additional land within the next few years. These efforts came through sustained hard work and opportunistic responses when key properties came on the market or were removed from Chapter 61 protections.

#### **ACQUISITIONS BY THE TOWN OF CARLISLE**

Since 2013, Carlisle has acquired four properties for open space.

##### *Russell Conservation Land*

This 22-acre property surrounding the Garrison Place Senior Residential Open Space Community (SROSC) on Russell Street was deeded to the Town for conservation purposes in 2018. It has two certified vernal pools and a loop trail.

##### *Woodward Conservation Land*

This 6-acre open space property (comprising two building lots) was purchased by the Town—exercising its right of first refusal for properties being withdrawn from Chapter 61A—for conservation purposes in 2017. The parcel is bounded to the north and the east by 32 acres of

meadow, wetlands, and woodlands that are expected to be deeded to the Town in 2021 and which connect to and extend the trails system in Great Meadows National Wildlife Refuge (GMNWR).

#### *Hartwell Woods*

This 7.38-acre property on Carlisle's southern border sits between the Bisbee Land to the north and Concord Land Conservation Trust's Hartwell Meadow in Concord. Along with the Benfield Conservation Land and the Carlisle Conservation Foundation's Spencer Brook Reservation, these parcels collectively protect more than 100 acres of the Spencer Brook watershed. Hartwell Woods consists of parcels not developed due to the change, in 1989, in the subdivision road location for the 1989 Hartwell Road development; the parcels were taken by the Town for non-payment of taxes in 2007 and 2012. The property was transferred to the care, custody, control, and management of the Conservation Commission (ConsCom) at 2018 Town Meeting.

#### *Blanchette Land*

These two parcels, a combined 4.41 acres of the former Blanchette property, were deeded to the Town for conservation purposes in 2018 as part of the development of the Arrowhead Lane common driveway off Rutland Street. The land is mostly wooded upland but would have required a lengthy wetland crossing for development access and now serves primarily as a buffer for the developed areas of Great Brook Estates and the new homes off Arrowhead Lane.

#### **ACQUISITIONS BY THE CARLISLE CONSERVATION FOUNDATION**

The Carlisle Conservation Foundation (CCF) is an independent non-profit committed to protecting the rural character of the town through the conservation of open space. Since 2013, CCF has not acquired any additional fee interest properties, but it has helped with the acquisition of two parcels totaling 6 acres and the eventual receipt by the Town of an additional 32 acres of adjacent open space.

In 2017, CCF facilitated the first step in the protection of the Woodward Land by contributing \$250,000 of the \$750,000 purchase price (the remaining \$500,000 from Community Preservation Act (CPA) funds) of two lots totaling 6 acres comprising meadows, woods, and wetlands along Maple Street and Bedford Road. Responding quickly to a notice of the parcels' removal from Chapter 61A, CCF Board members solicited support from Town boards (ConsCom approved up to \$10,000 from their Conservation Fund to cover an appraisal, environmental assessment, and other due diligence related to the purchase), helped develop a new Open Space development bylaw (working with the landowners and a developer), and made the presentation to Town Meeting that set the stage for another 32 acres to come to the Town for open space following the approval of the Residential Open Space Community development on the adjoining Woodward family parcel.

Together, these 38 acres abut Great Meadows National Wildlife Refuge and will expand the extensive trail network extending from Foss Farm to the Greenough Land. The preserved open space set-aside is achieved through denser development consisting of 18 energy-efficient condo units in 16 structures sited on less than 10 acres, providing somewhat less expensive housing units of as little as half the square footage of typical single-family Carlisle homes, plus much smaller common landscaped areas requiring less irrigation and maintenance.

## **2. Land Protection**

### **INITIATIVES OF THE CARLISLE CONSERVATION FOUNDATION**

Since 2013, CCF has been busy as it continues to take a leadership role in the preservation of critical open space in town, working to preserve all or most of four properties ranked Priority 1 for preservation in the 2013 OS&RP. After finalizing its successful collaboration on the Elliott Concord River Preserve (just as the 2013 OS&RP was being completed), CCF again partnered with the Sudbury Valley Trustees (SVT) on the preservation of the 28-acre Woodhaven Farm on Prospect Street. Private donations of almost \$300,000 supplemented an \$85,000 state Conservation Partnership Grant received by SVT, a \$25,000 Bafflin Foundation grant, and a \$5,000 grant from the Fields Pond Foundation to reach the \$410,000 fundraising goal to acquire the CR (\$350,000), to cover acquisition costs, and to provide stewardship funds to be held by SVT.

CCF and SVT worked with the Trails Committee to add new trails bordering the working farm and connecting Prospect Street to the extensive trail system in the Davis Corridor. The CR, approved in June 2016, is one of the more complex CRs that CCF has developed, with different areas allowing agricultural uses including experimental forest-based animal husbandry and limited building envelopes for possible replacement of the existing home and for future farm buildings.

Simultaneously, after working behind the scenes with the Sorli family on and off for almost 2 decades, CCF coordinated with the Town to preserve the iconic, historic south Sorli Farm fields, which, along with the farm buildings and fields on the north side of Westford Street (Route 225), define the entrance to Carlisle from the west. April 2016 Town Meeting approved \$850,000 in CPA funds towards the purchase of the 20-acre CR including approximately 9 acres of woodlands east of the hay field and excluding approximately 6 acres around the existing building to the west and a small 2-acre lot to the east across from the beginning of Curve Street. CCF contributed the remaining \$20,000 of the purchase price plus more than \$32,000 in appraisal, surveying, and legal expenses to bring this opportunity to the Town. The CR, approved by the state in March 2017 and held jointly by the Town and CCF, allows limited public access and requires the grantee to maintain the current open, agricultural field condition of the cleared portion of the property.

As noted above, CCF also facilitated the protection of the Woodward Land.

### **CONSERVATION RESTRICTIONS**

Since 2013, the Town of Carlisle has permanently protected by CR an additional 6.17 acres of its publicly owned conservation land. An additional 61.49 acres of privately owned land has been protected by CRs. The Conservation Restriction Advisory Committee (CRAC) meets regularly throughout the year and advises the Town on the acceptance of new CRs and monitors those CRs held by the Town. The Committee strives to educate property owners with CRs on the legal constraints on the use of lands under CRs and works directly with homeowners to create or amend CRs to the great benefit of the Town.

On privately owned land, the CRs may or may not allow public access. CRs may also allow for building envelopes in specified locations within the CR, usually limited to single family homes or

structures related to agriculture. Thus, the acreage of a CR shown on Table 5 or the total protected acreage in town noted above is not necessarily exclusively fields, woodlands, or wetlands, though the terms of a CR generally protect a parcel from further subdivision.

A conservation restriction is an important tool for land protection. CRs on potentially vulnerable land in town help Carlisle retain its rural character, protect its water resources, and provide wildlife habitat and corridors. CRs also increase the potential for trail connections, both between already existing conservation properties in Carlisle and into abutting public lands of contiguous towns.

CRs also help control future development. A case in point is the Valentine Land, 105 acres of which were protected via CR #63 in 2008, adding to the 10 acres protected by CR #43 in 2001. The 2008 CR preserves rural vistas of field farmland by limiting building envelopes to the interiors of 17 building lots. The building lots are just now in 2020 beginning to be marketed to developers; homes will be built, but the visible rural character of this part of the community will be preserved indefinitely thanks to the foresight of Jack and Betty Valentine one and two decades ago. The CR on the Sorli Farm south fields precludes development on what would have been at least three house lots, and the Woodhaven Farm CR precludes a subdivision of at least ten houses.

CRs are sometimes amended or superseded by later CRs. CR #10, originally granted to the Town in 1978, was superseded by a new CR #69 in July 2019, this time granted to ConsCom. The new CR creates a pair of trail easement areas to allow permanent connections from Bellows Hill Road to the Rockstrom Trail and from the Rockstrom Trail to the Carlisle Trail in Harvard's Estabrook Woods. In late 2017 and early 2018, rather than amending the small (0.17 acre) CR #25, originally granted in 1992, CRAC negotiated a permanent trail easement to provide an improved location for the trail connection between Banta-Davis and Rodgers Road. Taking advantage of the new easement later in 2018, the Trails Committee built two new boardwalks—the longest one 120 feet—over wetlands that cross the Rodgers Connector.

#### **PROTECTION OF SPECIFIC PARCELS**

##### *Black Brook Farm, Sorli South Fields, and Woodhaven Farm*

Acting through the Department of Conservation and Recreation (DCR), the Commonwealth of Massachusetts acquired a CR in October 2020—allowing continued agriculture on the historic Black Brook Farm—on 12.9 acres of the 14.34-acre Erickson parcel off Lowell Street. In 2000, with fundraising assistance from CCF, the State acquired 8 acres surrounding the farm that added to Great Brook Farm State Park (GBFSP) and provided a buffer to trails in the park.

As noted above (Initiatives of CCF) and detailed in Sections 7 and 8, CRs on the Sorli Farm south fields and Woodhaven Farm provide protection for approximately 48 acres in Carlisle.

### **3. Land Management**

#### **STEWARDSHIP**

The mission of the Land Stewardship Committee (LSC) is to assist the Conservation Commission with its task of managing Town-owned conservation land to protect, maintain, and enhance conservation interests on the 35 conservation properties (totaling 1,142 acres) owned by the Town of Carlisle. Through a program of land management and maintenance activities, the LSC protects

natural and cultural resources, including wildlife habitat, water and forest resources, agricultural lands, passive recreational uses, scenic vistas, historic structures, and related cultural values.

Since 2013, LSC has worked with ConsCom to prepare revised agricultural lease and license agreements for Town-owned conservation lands. Addressing a long-standing issue, lease and license agreements now include a requirement for field-edge maintenance. LSC prepared a management plan for Foss Farm. Following up on a goal from the 2013 OS&RP, since 2019, LSC has been overseeing a project to assess, repair, and clean all existing signs on Town-owned conservation lands and to assess the need for new signage. Guidance for dog owners and dog walkers was provided on signs at the Cranberry Bog.

CCF hired a conservation professional to prepare baseline assessments of Ben's Woods, Benfield Hill, and CCF's part of the Greenough Land.

#### **INVASIVES CONTROL**

ConsCom sought and received \$14K in CPA funding in 2016 for removal of Poison Ivy, Buckthorn, and other invasives to restore Towle Field. Triclopyr herbicide was sprayed on Poison Ivy throughout the field, painted on cut stems of Buckthorn along the edges, and sprayed on smaller bushes. Carlisle is part of the Sudbury Assabet Concord (SuAsCo) Cooperative Invasive Species Management Area (CISMA) and received a grant in 2012 from the National Fish and Wildlife Foundation to control invasives on Foss Farm Conservation Land and part of Ben's Woods (CCF land). In 2014, CCF worked with the New England Wild Flower Society (now the Native Plant Trust) to cut and paint stems (mostly Oriental Bittersweet) with herbicide in a 1-acre field that is part of Ben's Woods along West Street. CCF regularly mows the sloped rocky field to help control the invasives. Regular mowing helps control invasives in the Spencer Brook Reservation field, aided by occasional work crews removing Oriental Bittersweet along the stone wall bordering South Street.

#### **4. Land Use**

##### **TRAILS COMMITTEE**

The Trails Committee produced an updated, full-color, wire-bound, Geographic Information Systems (GIS)-based edition of its *Trails in Carlisle* in 2018. (CCF purchased additional copies of the trails book and provided 400 books to the Carlisle Schools for delivery of one book to the family of every Carlisle student. CCF also provided an additional 80 books for schoolteachers as an incentive for them to integrate Carlisle's trails into their curricula.) The maps are also displayed on the Trails Committee website, launched in 2007, and on the Town website. (See Map 10 for a map of the entire town showing existing trails and pathways.)

Since 2013, the Trails Committee, in several cases assisted by the Carlisle Boy Scout troop, has created new trails connecting Carlisle Pines State Forest to the MacAfee trail and thence to trails in Westford and Chelmsford. It has also created trails on the Russell Street Conservation Land, open space created by the Garrison Place SROSC development. The Trails Committee coordinated the construction or repair of 832 feet of boardwalks and 288 feet of duckboards, which are narrow boardwalks placed directly on the ground to allow a trail user to bypass wet or muddy areas of trail, to improve or extend trails throughout the trail network and to protect wetlands from damage caused by pedestrians and horses. It also installed 13 benches beside trails.

In 2019, the Town appropriated \$15,000 from Community Preservation Act funds to cover costs for materials and permitting needed to build boardwalks, bridges, kiosks, and signs over a 5-year period. (In 2015, the 5-year 2010 CPA appropriation of \$15,000 was extended through 2018.) The Trails Committee received a \$1,500 grant from the River Stewardship Council for trail improvements in Greenough and has received a \$1,065 grant from Brendon Properties, the developers of Garrison Place on Russell Street, towards boardwalks and a staircase leading from Russell Street down to the front field.

Until the shutdown brought on by the pandemic, the Trails Committee has continued to lead approximately five public walks per year to promote enjoyment and appreciation of conservation land in Carlisle. The Committee has also led trail walks for the public on parcels of land that the Town is considering purchasing for preservation. The Trekker Award is given to individuals who document that they have hiked almost all the trails in town, volunteer for trail work, and attend a Trails Committee meeting. Announcements of the awards in the *Carlisle Mosquito* have encouraged more people to support the Committee's efforts and to hike the trails. Through the end of 2020, 56 residents have earned the award.

#### **CARLISLE CONSERVATION FOUNDATION**

Beginning in 2012, CCF has sponsored seasonal nature walks on Carlisle's conservation lands, including CCF's Spencer Brook Reservation and Benfield Hill; the Town's Foss Farm, Cranberry Bog, and Greenough conservation parcels; GBFSP; and GMNWR. The walks have focused on birds, dragonflies, mushrooms, lichens, vernal pools, wildflowers, stone walls, and winter identification of trees and animal tracks. CCF has also sponsored talks at the public library on pollinators, wildlife cameras, and the Bay Circuit Trail, among other topics. Walks and Talks were suspended for the last 10 months in 2020 due to the COVID-19 pandemic.

The pandemic also affected the second annual Carlisle Community Trails Day Challenge. This event, cosponsored by CCF and the Trails Committee (along with some local business sponsors), was initiated in 2019 to encourage Carlisle residents and their friends to experience the natural beauty of Carlisle from its trails. The "challenge" was for people collectively to walk all 55 miles of Carlisle's trails in a single day. On May 18, 2019, more than 275 individuals covered all the trails, collectively walking more than 760 total miles. For 2020, during the pandemic, the value of Carlisle's open spaces as a de-stressor was more pronounced, but, given social-distancing protocols, the challenge ran for an entire month. Again, all the trails were covered. Several individuals met a personal challenge to walk all the trails him or herself, and many walkers filed reports and posted photos on CCF's Instagram feed of the flora and fauna they encountered on their walks.

#### **RECREATION COMMISSION**

In 2015, Carlisle supported the renovation and expansion of fields and facilities at the regional high school in Concord, providing \$400,000 in CPA funds to cover one quarter of the local public funding for the \$5 million project (the remaining \$3.4 million raised privately through the efforts of CC at Play, a local not-for-profit organization formed for this purpose). The work was done in phases, with everything completed by 2018.

Substantial progress has been made in recent years to improve the condition of Carlisle's playing fields, especially at Banta-Davis. Since 2015, the Recreation Commission has been transitioning the maintenance of fields, playgrounds, and other facilities away from volunteers and toward professional maintenance companies. The results of this investment have paid off in the form of stronger, greener turf and higher-quality playing surfaces. The town has appropriated funds to attend to several deferred maintenance problems at both Spalding and Banta-Davis. In 2019, Town Meeting appropriated \$20,000 for a study of surface and subsurface water issues at Spalding Field; the study should be initiated in 2021.

A beach volleyball court was added to Banta-Davis in 2014. The Church Street tennis courts were repaired in 2015. In 2020, RecCom voted funds to add pickleball court lines to these courts. A seasonal outdoor skating rink at the parking lot of Kimball's ice cream stand has been installed each winter by RecCom due to significant demand for outdoor skating access, but the Commission has recently decided to discontinue this practice due to the many problems associated with maintenance.

#### **BRUCE FREEMAN RAIL TRAIL**

The Bruce Freeman Rail Trail is a partially completed, 25-mile trail through property in the communities of Lowell, Chelmsford, Westford, Carlisle, Acton, Concord, Sudbury, and Framingham using the abandoned rail beds of New Haven Railroad's Framingham and Lowell line. Phase 1 of the trail (6.8 miles in Lowell, Chelmsford, and Westford, stopping just short of the Carlisle town line) opened to the public in October 2010. Phase 2 (including Westford, Carlisle, Acton, Concord, and Sudbury) includes 4 sub-phases (2a, 2b, 2c, and 2d). Phase 2a (4.9 miles in Westford, Carlisle, and Acton, from the Carlisle town line to near the Concord border) opened to the public in April 2018. Phase 2c (2.5 miles in Concord) opened in September 2019. Phase 2b (bridge across Route 2 to link Phases 2a and 2c) was begun in June 2020 and is planned for completion by Spring 2022. Phase 2d (south Concord line to Route 20) remains to be completed. Phase 3 (including Sudbury and Framingham) remain as proposed extensions on land still owned by the railroad company CSX. The trail is open to non-motorized uses such as cycling, jogging, walking, and cross-country skiing. The Carlisle portion, completed in Phase 2, is just 0.2 mile long.

#### **NATIONAL WILD AND SCENIC RIVERS**

In 1995, Carlisle Annual Town Meeting passed a warrant article to petition the U. S. Congress to enact legislation designating the Concord River as part of the National Wild and Scenic Rivers System under the jurisdiction of the National Park System. Congress subsequently acted to place 29 miles of the Sudbury, Assabet, and Concord Rivers officially into the National Wild and Scenic Rivers System. These 29 miles run from the Danforth Street Bridge in Saxonville (Framingham) to the Route 3 Bridge in Billerica as well as downstream of the Damon Mill Dam on the Assabet, thereby including all of the Concord River frontage in Carlisle.

Carlisle is represented on the Sudbury, Assabet, and Concord (SuAsCo) Stewardship Council. Through the Conservation Commission and Trails Committee, Carlisle participates in the annual celebration of Riverfest organized by the SuAsCo Stewardship Council and the National Park Service.

## 5. Legal Issues

### THE COMMUNITY PRESERVATION ACT

Carlisle adopted the state's Community Preservation Act (CPA) in spring 2001. Town citizens elected to levy a 2% surcharge on real estate taxes, excluding the first \$100,000 in assessed value, for three uses: open space (conservation and recreation), historic preservation, and community housing. A minimum of 10% of the fund must be used for each of the three CPA-designated uses. Carlisle's citizens reaffirmed their support for the real estate tax surcharge by soundly defeating a warrant article to rescind the CPA at a Special Town Meeting in 2011.

A Community Preservation Committee (CPC) was established to oversee CPA funding proposals. The Committee consists of seven members, one each from the Conservation Commission, Historical Commission, Planning Board, Recreation Commission, Housing Trust, Select Board, and one member from the community at large. The CPC can recommend expenditures, but funds can be appropriated only by approval at Town Meeting.

As noted in Section 7 (Analysis of Needs), significant CPA funding was appropriated in 2016 toward the purchase of a CR on 20 acres of the Sorli Farm south fields and in 2017 toward the purchase of 6 acres of the Woodward Land. A list of conservation and recreation projects receiving CPA allocations is provided in Appendix J.

### B. Planning Process and Public Participation

Section 6 documents Carlisle's ongoing history of soliciting input from its residents about the Town's long-term plans and the consistent support from residents for maintaining the rural character of Carlisle through the preservation of open space and for maintaining and enhancing opportunities for active and passive recreation. Section 6 also includes detailed descriptions of the Master Planning process, which coincided with the development of this OS&RP. Master Planning public outreach and public forums (advertised in the *Carlisle Mosquito* and via mailings to all residents)—before the shutdown in March 2020 due to the pandemic—provided information about open space, recreation, and natural resources, that has been incorporated into this OS&RP.

The 2020 OS&RP Committee, consisting of representatives from the Conservation Commission, the Land Stewardship Committee, the Recreation Commission, the Trails Committee, and the Carlisle Conservation Foundation and citizen representatives, met regularly from December 2019 through March 2020 and then intermittently via Zoom through the remainder of 2020 and early 2021. All OS&RP Committee meetings were publicly noticed online and via written notices posted at Town Hall. The OS&RP Committee coordinated its efforts with those of the Master Plan Steering Committee.

Early in 2020, Committee members reached out to stakeholders in the conservation community (including experts on the local flora and fauna, citizens who have spearheaded past preservation efforts, and professionals in environmental engineering and public policy) to gather input on the key factors to consider when assessing currently unprotected lands for conservation interest. This input from the public informed the revision of the ranking criteria (values) used to prioritize private parcels of 10 acres or more.

The value of “Active Recreation” was expanded from land suitable for playing fields or garden plots to include land suitable for recreational facilities or recreational activities such as sledding, swimming, and ice skating. “Core Habitat” was revised to reference specifically areas in town identified in MassWildlife’s Natural Heritage & Endangered Species Program’s (NHESP’s) BioMap 2 and the 2011 CAPS (Conservation Assessment and Prioritization System) IEI (Index of Ecological Integrity) for the Town of Carlisle, MA. “Level of Development” was revised to consider whether a large parcel with significant development could be subdivided to create a significant relatively undeveloped parcel. Because there are few very large undeveloped parcels remaining, “Size” was revised to give the highest score to parcels larger than 30, rather than 40 acres. The ranking criteria are detailed in Section 5.

Once the ranking criteria were established, the Committee placed multiple press releases in the *Carlisle Mosquito* (distributed free to all Carlisle residents and available online) describing the OS&RP and its importance, with invitations to the public to attend ranking sessions to review in detail all the private lands in Carlisle of 10 acres or more. Two public meetings, scheduled for March, had to be cancelled due to the pandemic. After several months of lockdown, with no clear end in sight, the committee decided to hold the two ranking sessions in June virtually via Zoom. Outreach was through the online edition of the *Carlisle Mosquito* and email invitations disseminated widely through several conservation networks in town. Hosting the sessions online required extra work to prepare and disseminate a list of the land protection values with the agreed-upon definitions, a detailed map (showing the large unprotected parcels to be ranked and all the conservation lands, lands under CR, municipal lands, roads, trails and pathways, and wetlands and other water resources), aerial composites with parcel bounds adapted from the MassGIS Oliver system, and interactive ranking sheets with details about each parcel. Both of the sessions had as broad, if not broader, participation than the in-person sessions held for the previous two editions of the OS&RP.

In an effort to gather additional data necessary for this report, the Committee sent letters at the beginning of 2020 to the following Carlisle entities requesting their goals, objectives, and initiatives for the next seven years (entities newly added for this plan are shown in *italic*): *Agricultural Commission*, Board of Assessors, Board of Health, Select Board (formerly named the Board of Selectmen), Carlisle Conservation Foundation, *Carlisle School Committee*, Conservation Commission, Conservation Restriction Advisory Committee, Council on Aging, *Deer Control Committee*, Finance Committee, Historical Commission, Affordable Housing Trust, Land Stewardship Committee, Planning Board, Recreation Commission, *Sudbury Valley Trustees*, *Traffic and Pedestrian Safety Committee*, Trails Committee, and *Youth Commission*. The input from each of these entities is included in Section 9.

In addition, OS&RP Committee members met with representatives of the conservation commissions in the six neighboring towns of Acton, Bedford, Billerica, Chelmsford, Concord, and Westford. The areas of mutual concern gleaned from these meetings are included in Section 3.

As part of the Americans with Disabilities Act (ADA) Access Self-Evaluation, through the latter part of 2020 the OS&RP Committee gathered information from the Town Administrator, Conservation Commission, Recreation Commission, Trails Committee, Council on Aging,

Carlisle Public Schools, Gleason Public Library, Fire Chief, a senior housing community, and three religious institutions concerning handicapped accessibility of lands, buildings, and facilities in Carlisle. The accessibility of Conservation, Recreation, and School lands and facilities are listed in Table 11. Table 11 and the majority of the ADA Access Self-Evaluation forms were reviewed by two Carlisle residents with disabilities and by the Council on Aging Social Worker.

A member of the Committee had the necessary GIS mapping skills to utilize Town GIS maps and state GIS data layers to create the required and optional maps included in this plan.

The Committee then developed a working draft of the 2020/2021 Open Space and Recreation Plan, including required maps and tables (with information updated through October 31, 2020), and posted it on the Town’s website early in 2021 for review by the public and all the boards and committees whose input had been solicited, as noted above, for the updated Action Plan. A notice was placed in the *Carlisle Mosquito*, the local weekly newspaper distributed for free to all households, requesting feedback. A link to the draft was also shared with the Metropolitan Area Planning Council (MAPC) and the Division of Conservation Services (DCS).

In their review and comments, MAPC noted that Carlisle’s OS&RP “will help to advance several *MetroFuture* goals and implementation strategies that relate specifically to encouraging land protection, addressing climate change, enhancing safer pedestrian pathways and trail networks, and promoting accessibility to regional resources. The plan includes a section on regional coordination and an assessment of key open space and recreational resources in surrounding communities. . . . [It] provides a great deal of specifics regarding its parks and open spaces, which includes an assessment of their current condition and future needs. The open space and recreational resource inventory maps are particularly detailed, as is the Action Plan map. It should serve the Town well as it continues its efforts to preserve open space and provide for the recreational needs of its residents.”

In March, the OS&RP received conditional approval from DCS through March 2028—the conditions requiring some additions and edits to the draft plan. The Committee made the necessary revisions and incorporated the input received from town entities and members of the public, as appropriate, into a final draft, which was submitted in May 2021 to Carlisle’s Select Board, Conservation Commission, Recreation Commission, and Planning Board for formal letters of approval. The Plan was also submitted to DCS for final approval. The approval letters are included in Section 10. Copies of the 2020/2021 OS&RP were then printed and provided to the appropriate Town and state entities. Two printed copies are on file in Gleason Public Library and an electronic copy is posted on the Town website.

### Section 3: Community Setting

- A. Regional Context
- B. History of the Community
- C. Population Characteristics
- D. Growth and Development Patterns



*Seen here from North Road, Great Brook Farm is a working dairy farm with a state-of-the-art barn and robotic milking facility and is part of Great Brook Farm State Park, which includes a visitors center, ice cream stand and picnic area, historic Native American and early settler sites, plus over 20 miles of trails used by walkers, mountain bikers, horseback riders, and cross-country skiers.*

## Section 3: Community Setting

*Carlisle, Middlesex County, Massachusetts, is bounded on the north by Chelmsford and Billerica; on the east by Billerica and Bedford; on the south by Concord; and on the west by Acton and Westford; and had assessed in the year 1917, 9886 acres of land. The location is considered extremely healthful and comfortable, being just far enough from the salt water to be properly tempered by the ocean breezes, but near enough to escape the extremes of heat or cold that locations farther inland experience.*

*The contour of the landscape is typical of New England, being undulating or diversified with hill and dale, giving the section a pleasing variety of scenery that is not monotonous.*

*Carlisle is an agricultural town, and the land gives good returns for the efforts of the husbandman. Being located but eighteen miles from Boston, and nine miles from Lowell, good markets are within easy access by team or truck.*

*The mean altitude of the town is two hundred feet above sea level, that being the altitude of the center of town. There are four hills in the town that attain altitudes as follows: School House Hill has an altitude of 240 feet; Bellows Hill in the southern part has an altitude of 260 feet; Wilkins Hill in the western part is 300 feet; and Wilson Hill in the eastern part is 380 feet. There are no natural ponds or lakes in town large enough to receive a name. Tophet Swamp, a brushy and wooded marsh, occupies a central position in the area of the town, and has an altitude of one hundred and eighty feet above sea level; that really amounts to a divide, as all streams of water having their source on its northern border flow to the north, and those rising on its southern border flow to the south.*

*History of the Town of Carlisle Massachusetts by Sidney A. Bull, 1920*

### A. Regional Context

#### Physical Location

Carlisle is a 15.4-square-mile town located about 18 miles northwest of Boston, between circumferential I-95 (Route 128) and I-495 and radial Routes 2 and 3. Though closer to Lowell than to Boston, it is considered part of greater Boston's metropolitan area. Carlisle's open space also serves the Lowell metropolitan area. In 2010, according to the U.S. Census, Carlisle had a population of 4,852. The Town census for 2010, however, had the population at a peak of 5,602; for 2019, the population listed in the Town Annual Report was 5,335.

Carlisle has a classic geographical shape, being almost circular, with five main roads converging at the Town Center. The Center area includes the town rotary with the Civil War memorial "Goddess of Liberty" statue, churches, schools, recreation fields, the public library, the fire station, the police station, Town Hall, a post office, a few commercial enterprises, single-family homes, Center Park, and the Village Green. The Center has a defined Historic District, which protects the historic buildings and their scenic surroundings (Map 11).

#### Regional Aspects

Carlisle is bordered by the six towns of Acton, Bedford, Billerica, Chelmsford, Concord, and Westford (Map 1). Carlisle shares various natural resources with these towns, including the

Concord River, Great Meadows National Wildlife Refuge (GMNWR), Greater Estabrook Woods, the Cranberry Bog Conservation Land, and other open space parcels, roads and trails, streams and watersheds. Carlisle is in the Sudbury, Assabet, and Concord Rivers watershed.

Great Brook Farm State Park (GBFSP), located in Carlisle, is a wonderful regional resource with trails for hiking, biking, horseback riding, snowshoeing, and cross-country skiing. It also provides ample opportunities for picnicking, nature study, and close observation of active agricultural activities, both traditional and state of the art.

The Bruce Freeman Rail Trail runs through a corner of Carlisle just east and south of the junction of Routes 225 and 27. Carlisle residents can gain access just over the border with Westford on Route 225 or via trails on the MacAfee and Holmes-Avery Lands from Kimball Road to Sleigh Road in Westford.

Carlisle is considered a rural suburb in the extended northwest metropolitan Boston area, just outside of I-95 (Route 128). It is a middle- to upper-income residential community with very little commercial development. Its picturesque rural nature brings people from neighboring towns to use the conservation lands for dog walking, hiking, bird watching, bicycling, and other outdoor activities.

Problems caused by the popularity of some conservation lands among commercial dog walkers were addressed by a bylaw amendment passed at 2018 Town Meeting. The bylaw now requires dog-walking companies to register with the police and receive free permits to display in car windows, limits companies to three permits, and limits dog walkers to 5 dogs per permit. Though the bylaw does not require dogs to be leashed, it was amended to require a leash to be carried at all times.

Carlisle roads and some of its trails are popular among bicyclists. One Town-owned conservation parcel, Foss Farm, offers simple riding rings maintained by a local pony club. Dog sledders in the area also use Foss Farm to train their dog teams during the winter months. In addition, this property has a large community garden area that is open to gardeners in Carlisle and other towns.

Carlisle has a variety of public recreation facilities. Residents also have access to Concord's playing fields, outdoor track, and other facilities. (See Section 7 for more details.)

Members of the OS&RP Committee met with the Conservation Administrators of neighboring towns in February and March 2020 to discuss open space planning issues related to shared and adjacent resources. Following are summaries by town of the issues of common interest discussed, including future trail and open space connections and efforts to control invasive plant species. The towns of Carlisle, Acton, Billerica, Chelmsford, and Concord and the land trust in Westford are all members of the SuAsCo Cooperative Invasive Species Management Area (CISMA), a regional, invasive-species group that is discussed in more detail below. (See Regional Coordination below.)

#### **ACTON**

The town of Acton abuts the western border of Carlisle from Pope Road to Route 225. This area has seen significant consolidation of protected land in both towns. The Bruce Freeman Rail Trail

briefly enters Carlisle at the north end of this shared border. During the discussions earlier this year, representatives of Town of Acton and Acton non-profit conservation entities expressed interest in moving an easement on one of the Valentine building lots in Carlisle along the Acton border to provide better access to the Rail Trail at that point.

Potential trail links identified in the 2013 OS&RP between Carlisle Conservation Foundation (CCF) land in southwest Carlisle and several Acton conservation lands have been effectuated via an easement across a narrow point of private property in Carlisle.

During the discussions, Acton identified an 80-acre parcel off Triangle Farm Lane in Acton south of the intersection of Pope Road and West Street near the Acton-Carlisle border as one of interest for preservation due to its proximity to existing Acton conservation land. Acton was also interested in the status of several Carlisle properties: a few CCF-owned parcels and a private, unprotected 20-acre parcel along the Acton border. The Carlisle representatives shared the Town's experience with successful use of Community Preservation Act (CPA) funds to preserve lands for conservation through outright acquisition and funding CRs.

#### **BEDFORD**

The Town of Bedford and the Town of Carlisle share a length of the Concord River, a designated Wild and Scenic River, as a common town boundary. This boundary extends both north and south of the Route 225 bridge over the river. Open spaces connected by the river between the two towns are significant, with GMNWR owning 775 acres along the entire river frontage with Bedford and almost the entire river frontage with Concord (all but a single small privately owned lot that the town has been unsuccessful in acquiring). Bedford would like to see GMNWR make efforts to protect scrub-shrub areas along the river. Bedford residents trying to preserve their river view cleared vegetation adjacent to the river near Two Brothers Rocks in the Town-owned Altmann Conservation Area without a permit from the Bedford Conservation Commission, which promised to maintain a cleared view corridor. Abutting GMNWR near Bedford's northwestern border across the river from Carlisle is the 203 acres of the Huckins Farm CR, preserved when the 200-year-old farm and apple orchard was developed between 1988 and 1998 into a 164-condominium community with a recreation center, tennis courts, swimming pool, and equestrian center. Trails run through these Bedford conservation lands into GMNWR across from Carlisle providing views of the river.

In spring 2013, the Town of Carlisle, CCF, and the Sudbury Valley Trustees (SVT) coordinated a successful effort to preserve the publicly accessible 9-acre Elliott Concord River Preserve upstream of the Route 225 bridge at the Bedford-Carlisle line, protecting nearly 1,000 feet of river frontage on the Carlisle side. A loop trail was added to the property, and, in the summer of 2020, volunteers from the Trails Committee and Sudbury Valley Trustees added stones to provide better footing for visitors to the Preserve from the canoe landing accessible by the trail.

Under the Natural Heritage & Endangered Species Program (NHESP), Wood Turtle (*Glyptemis insculpta*) habitat exists in areas of Foss Farm Conservation Land and in GMNWR on both the Carlisle and Bedford sides of the river. These areas also have habitat for rare plants, amphibians, and reptiles.

## **BILLERICA**

The towns of Billerica and Carlisle share abutting open space in the Greenough Conservation Land; the 8.22-acre portion in Billerica is owned by CCF. A large natural corridor exists between the contiguous parcels owned in both towns and GMNWR along the Concord River. Trails connect from Billerica through Carlisle along the Concord River. Billerica has developed trails on the east side of the river via Dudley Park. During Carlisle's March 2020 meeting with Isabel Tourkontonis, Billerica's Director of Environmental Affairs, a possible large development on 78 acres southwest of Route 4 and northwest of Rangeway Road in Billerica was discussed; the development might provide access to trails in Great Brook Farm State Park that could increase trail traffic there and in Chelmsford's Thanksgiving Forest.

Billerica does not allow hunting on public land. The Town of Billerica has invested considerable resources on managing beavers, annually funding beaver control by a private company. The number of beaver-control projects has increased 8 fold between 2000 and 2019, suggesting increased beaver activity that may affect neighboring towns such as Carlisle. Billerica is in the beginning phase of a climate-vulnerability assessment under the state Municipal Vulnerability Preparedness (MVP) grant program under which Carlisle recently received a grant. Due to common interests in maintaining the Greenough Pond and adjacent conservation land, Ms. Tourkontonis agreed to provide a letter of approval and support for Carlisle's pending grant application for the restoration of Greenough Dam. (See page 5-14).

## **CHELMSFORD**

Carlisle and Chelmsford share an important natural corridor along the town boundaries abutting GBFSP and the Carlisle Cranberry Bog Conservation Land. Although Chelmsford is considerably more developed than Carlisle, it has made a major effort to establish trails and other open space parcels in the vicinity of both the state park and the Cranberry Bog. Chelmsford has trail easements leading from the state park to its 16-acre Town Forest and to the 48-acre Thanksgiving Forest. Trails leading from the 151-acre Cranberry Bog Conservation Land in Carlisle into the abutting 165-acre Chelmsford Cranberry Bog Reservation are actively enjoyed by many in both communities.

Years of discussion and potential conflict between the two towns over water rights to the bog have been put to rest with a decision in early 2020 by the Chelmsford Water District to abandon plans for the development of a wellfield on land that abuts the Chelmsford portion of the Cranberry Bog. (See Section 5: Cranberry Bog Conservation Land, pp. 5-9 through 5-11.) Thanks in part to this decades-long controversy, representatives of Chelmsford and Carlisle ConsComs meet twice yearly to discuss issues. At the most recent meeting, Chelmsford's ConsCom reported that it has received \$25–30,000 to remove trees and repair the small dam that controls water flow to the westernmost bog pond in Carlisle.

## **CONCORD**

Concord shares several important resources with Carlisle: Greater Estabrook Woods, the Concord River, the Spencer Brook watershed, GMNWR, and a network of country roads used heavily by bicyclists. Estabrook Woods is designated a Core Habitat Area under the NHESP, and several public and private Carlisle conservation parcels are a part of this large natural corridor.

Carlisle and Concord also share boundaries within the U.S. Fish and Wildlife’s GMNWR along the Concord River. Some portion of this area is Priority Habitat under the NHESP. Concord has added 223 acres of conserved land along the Concord River and near the Greater Estabrook Woods, acquiring (with the Concord Land Conservation Trust (CLCT)) 80 acres of the October Farm in 2016 and benefiting from a legacy gift to Mass Audubon in 2019 of an abutting 143-acre parcel, Brewster’s Woods.

In 2017, the CLCT acquired Hartwell Meadow, a 5.3-acre hayfield abutting the Carlisle border just west of Lowell Road (Concord Road in Carlisle). The meadow abuts approximately 7 acres of Carlisle Town-owned land (that itself abuts the 34-acre Bisbee Land), mostly wetlands, transferred to the care and control of the Conservation Commission by 2018 Town Meeting and recently given the name “Hartwell Woods.” The CLCT aims to secure land in Concord north of Spencer Brook Road and west of Westford Road near the border with Acton and Carlisle. This acquisition, along with protected parcels in Carlisle (Spencer Brook Reservation, Benfield Conservation Land, and Bisbee Land) would help secure the Spencer Brook watershed. (See above re: Acton’s interest in a nearby parcel off Triangle Farm Road.)

#### **WESTFORD**

Carlisle’s border with Westford is characterized by extensive and contiguous stretches of protected lands on both sides of the border, including some parcels within Westford owned by CCF. (See Table 4.) The March 2020 meeting with Westford’s Conservation/Resource Planner helped clarify details about connections between trails in Carlisle and those in Westford, specifically from the Holmes-Avery Trail, MacAfee Trail, and Likely Trail in northwest Carlisle and connections to trails in Westford’s Rail Tree Hill neighborhood.

The Westford Conservation Commission joins with the Westford Conservation Trust when necessary to eradicate invasive non-native plant species such as Mile-a-Minute Vine (*Persicaria perfoliata*), Japanese Hops (*Humulus japonicus*), Japanese Knotweed (*Fallopia japonica*), and Oriental Bittersweet (*Celastrus orbiculatus*). For the past 7 to 8 years, Westford has participated in the Massachusetts DCR’s Lakes and Pond Program, which works to protect, manage, and restore aquatic resources and assist communities with educational materials. Through this program, DCR encourages local groups to take part in their Weed Watchers Program training. Westford has consequently formed a Stream Team that monitors water quality in streams and lakes and watches for invasive non-native plants such as Common Reed (*Phragmites australis*) and Curly-leaved Pondweed (*Potamogeton crispus*).

#### **Regional Coordination**

Carlisle is a member of the Metropolitan Area Planning Council (MAPC), the regional planning agency serving the 101 cities and towns of Metro Boston. The mission of MAPC is to promote smart growth and regional coordination. As stated on its website, MAPC works “toward sound municipal management, sustainable land use, protection of natural resources, efficient and affordable transportation, a diverse housing stock, public safety, economic development, clean energy, healthy communities, an informed public, and equity and opportunity among peoples of all backgrounds.” Smart growth principles encourage collaboration and the integration of people-focused strategies that reflect the culture and values of citizens in wise planning for the future.

The smart growth principle most directly related to this plan is to preserve open space, farmland, and critical environmental resources. Again from MAPC’s website: “Open Space, both within and surrounding developed areas enhances quality of life by providing community space, recreation opportunities, critical habitat for plants and wildlife, working lands for farming and forestry, and preserves the quality of critical environmental resources such as wetlands, watersheds, and drinking water supplies.”

In support of these and other goals, in 2008 MAPC developed *MetroFuture*, a regional policy plan through 2030 for the Boston metropolitan area, including Carlisle. The achievements and aspirations outlined in this OS&RP for Carlisle are consistent with the principles of smart growth listed above and the goals, objectives, and implementation strategies set forth in *MetroFuture*. These achievements and aspirations include the strong tradition of community involvement in planning in Carlisle, the foresighted adoption of the CPA, coordination with neighboring communities (as outlined above under Regional Aspects), and an ongoing tradition of permanent protection of open space. Carlisle has also initiated a GIS-based mapping process to improve data-gathering and sharing over time, has created a commission to support local agriculture, is working to improve pedestrian and bicycle access, safety, and the handicapped accessibility of municipal facilities, and has adopted a set of development standards and wetlands protection policies that promote the protection of the environment—particularly water supplies.

Carlisle is an active member of the Minuteman Advisory Group on Interlocal Coordination (MAGIC) sub-region of the MAPC. MAGIC is a group of representatives from thirteen communities that meets monthly to discuss issues of common concern. Carlisle has participated in the two most recent MAGIC initiatives. In 2018, MAGIC completed a Climate Change and Resilience Plan, including both a vulnerability assessment and adaptation and mitigation response strategies. From 2018 to 2020, MAGIC is focusing on age-friendly planning through a partnership with AARP and the World Health Organization (WHO). This initiative is entitled Regional Age Friendly Planning: Housing and Transportation. Carlisle representatives attended forums and meetings to develop these recommendations, and the town is participating in certain of the initiatives that resulted.

In 2009, a new regional group formed to focus on invasive-species documentation and control in the Sudbury, Assabet, and Concord (SuAsCo) River watershed. This group, the SuAsCo Cooperative Invasive Species Management Area (CISMA), has more than 40 member organizations, including towns, land trusts, interested non-governmental organizations such as the Massachusetts Audubon Society and the New England Wild Flower Society (now the Native Plant Trust), and governmental organizations such as the U.S. Fish and Wildlife Service, the National Park Service, and several state agencies. The Towns of Carlisle, Chelmsford, Acton, Billerica, and Concord are all partners of the CISMA. The land trusts in Concord, Carlisle, and Westford are also partners. The CISMA helps its members in many ways, including public education and technical training, sharing of tools and volunteers, and fundraising for control projects.

During the 2012 field season, Carlisle conducted two large projects to control invasive plants using funds from a grant obtained by the CISMA from the National Fish and Wildlife Foundation. Both projects had field restoration through invasives control as their primary focus.

Porcelain Berry, Winged Euonymus, Multiflora Rose, Glossy Buckthorn, and Oriental Bittersweet were targeted on Foss Farm Conservation Land and an abandoned field and surrounding woods on a CCF property off West Street. More recent and ongoing efforts are focused on controlling Poison Ivy and invasive plants on the Towle Land. (See page 4-26.)

Most surrounding towns also have concerns about invasive plants. Chelmsford has no plans to eradicate *Phragmites australis* in the Cranberry Bog. Water Chestnut has been found on Mill Pond. Bedford has *Phragmites australis* colonies it hopes to control by altering the water level. In Acton, CPA funds were used to hire a mechanical harvester for 3 years at \$12,000 per year. Acton's usual tactic is to allow volunteers to hand pull, cut, and grub; it does not encourage the use of herbicides. Billerica does not have a formal committee or program to address invasive plant species, but as noted above, it now participates in the SuAsCo CISMA partnership. In Concord, the focus is on rare species. It matches the control method to the situation; methods include promoting resident initiatives, hiring a land manager for conservation lands, and holding Garlic Mustard pulls. Concord has installed an invasive plant bin at the transfer station, periodically incinerates plants, has borrowed a harvester from USF&W to eradicate Water Chestnut, and has used goats to clear small areas of invasives near conservation lands. It recently engaged the Native Plant Trust for a \$10,000 removal effort of Glossy Buckthorn that was endangering a population of the state-listed Threatened Britton's Violet on an important conservation parcel.

### **Socio-economic Context**

Carlisle is a residential community of mostly single-family homes in a semi-rural setting. With a zoning requirement outside the Town Center of 2-acre full-frontage lots and 4-acre reduced-frontage lots, homes outside of the Town Center are situated on mostly wooded tracts of 2 to 4 acres, with some on larger lots. Due to the high cost of land, new houses tend to be larger than older houses: More than 50% of homes in Carlisle have more than 9 rooms compared to just over 40% in 2000. Each of the past two decades has seen approximately 140 housing units added, following 40 years of an average of more than 300 units per decade. The boom consisted primarily of standard subdivisions. The more common form of land development for the past 20 years has been the "conservation cluster" for which a developer receives a bonus lot in exchange for setting aside a minimum of 30% of the parcel as open space. In the past decade, major developments that included open space protection components are Benfield Farms (26 age- and income-restricted apartments, opened in 2014), Garrison Place (16 condominium units in a Senior Residential Open Space Community permitted in 2014), and Woodward Village (18 condominium units in a Residential Open Space Community, permitted in 2020).

The median value of a home in Carlisle rose from \$660,000 in 2010 to \$885,000 in November 2019. The median sale price in Carlisle is lower than that in Concord, higher than the median in Bedford, Acton, and Westford, and significantly higher than the median in Billerica and Chelmsford. One third of single-family home sales in Carlisle in 2019 were for more than \$1 million. About 90% of homes are valued over \$500,000.

The increase in housing costs was not matched by as large an increase in income level for Carlisle residents. Carlisle's median household income rose from \$160,903 in 2010 to \$195,889 in 2019.

For small towns such as Carlisle, non-decennial census data is considerably less accurate than decennial census data (the \$195,889 median income for 2019 is a 5-year average with a margin of error of +/- \$25,701) and is not directly comparable to the data from the 2010 census. The 2010 median household income for the Boston Metropolitan Statistical Area was \$68,020; the statewide median was \$62,072. The table below shows the income data for Carlisle households and families (2019 5-Year estimates) at various income levels, with margins of error.

<b>Income in the Past 12 Months (in 2019 Inflation-adjusted Dollars)</b>				
	<b>HOUSEHOLDS</b>		<b>FAMILIES</b>	
	<i>Estimate</i>	<i>Margin of Error</i>	<i>Estimate</i>	<i>Margin of Error</i>
<b>TOTAL</b>	1,876	+/- 89	1,473	+/- 92
Less than \$10,000	2.0%	+/- 1.7	0.4%	+/- 0.8
\$10,000 to \$14,999	0.5%	+/- 0.8	0.6%	+/- 0.8
\$15,000 to \$24,999	4.7%	+/- 2.4	3.8%	+/- 1.0
\$25,000 to \$34,999	5.0%	+/- 2.8	0.6%	+/- 2.6
\$35,000 to \$49,999	3.9%	+/- 2.6	3.4%	+/- 0.9
\$50,000 to \$74,999	4.1%	+/- 2.7	3.6%	+/- 2.7
\$75,000 to \$99,999	4.1%	+/- 2.1	4.5%	+/- 2.4
\$100,000 to \$149,999	15.4%	+/- 4.1	14.6%	+/- 4.6
\$150,000 to \$199,999	11.9%	+/- 3.8	11.3%	+/- 3.5
\$200,000 or more	48.5%	+/- 6.0	57.2%	+/- 6.5
Median income (\$)	195,889	+/- 25,701	235,134	+/- 30,311
Mean income (\$)	251,401	+/- 31,022	287,246	+/- 35,408

*\*Source, U.S. Census Bureau, 2019: ACS 5-Year Estimates Subject Tables*

Carlisle generally has much lower unemployment than the state as a whole. Although the unemployment statistics aren't exactly comparable due to the different way local and state unemployment figures are determined, the 2010 unemployment rate in Carlisle was approximately 5%, compared with about 8.5% statewide.

Carlisle is situated between Boston and Lowell, and it is midway between the technology industries along I-95 (Route 128) and those on I-495. Carlisle has no public transportation but has access to commuter trains in neighboring towns. Its rural setting is unusual considering its proximity to Boston. Annual statewide testing results confirm that its school system is excellent. Carlisle is a popular site for new homebuyers. Lack of industry and commercial development in Carlisle helps protect its quiet, rural ambiance, but the lack of any meaningful commercial tax base puts the property tax burden entirely on town residents.

## **B. History of the Community**

First settled by colonists in 1650, what would eventually become the Town of Carlisle has been predominantly a farming community for much of its existence. Beginning in Colonial times, Carlisle's many streams supported small mills of various types including fulling (for textiles),

grist, hoop, and saw, a few operating through the nineteenth century. Another early industry was burning limestone to get lime powder for plaster and other uses. The remains of a limestone quarry and several lime kilns are still visible in Carlisle. Several Colonial-era inns and taverns were situated on Carlisle's well-traveled roads; a few still stand and are private residences. Carlisle was first incorporated as a district in 1754, utilizing land formerly a part of Concord, but it was reintegrated with Concord two years later. The second district of Carlisle was formed in 1780 from parts of the surrounding towns of Acton, Chelmsford, Billerica, and Concord (Map 11). In 1805, the District of Carlisle was incorporated as a town.

A copper mine was operated successfully in the southern part of town for a short time in the late 1840s; it was put out of business by neighbors' complaints about the smelting operation and new and much more productive mines in Michigan. An abandoned granite quarry said to have supplied the granite for the historic Minuteman statue and obelisk at the Old North Bridge in Concord is located in the western part of town. It is now the site of a public communications tower.

Farms were primarily subsistence operations until the late 1800s. Farming was an export business through the nineteenth century, with farmers transporting farm produce and lumber to Boston markets. In 1900, Carlisle was still a small farming community, with the Assessors' Report for that year listing 126 houses (with a tax rate of \$16/\$1000 valuation), 205 horses, 529 cows, 100 other cattle, 24 swine, and 2,720 fowls. Most of Carlisle's dairy farming began at the turn of the last century. Poultry farming was extremely popular in Carlisle especially among Carlisle's Swedish immigrant families until the latter half of the 20th century.

Electricity came to Carlisle Center in 1911, but it was not until 1928 that Town Meeting voted to provide electricity along all the roads in town.

In 1933, the first zoning bylaw instituted 1-acre zoning. In 1956, 2-acre zoning was established, with a 1-acre District A zone defined within a 1500-foot radius of the memorial statue in the Center rotary (Map 3). Because each home relies on its own well and septic/leaching system, 2-acre zoning is important to Carlisle to protect water quality. In 1969, Carlisle established an Historic District to preserve the architectural aesthetics and historical vista in the Town Center. An appointed five-member Historical Commission is charged with the protection of the District, which includes many Colonial- and Federal-period homes.

Carlisle still has an Open Town Meeting as its form of government. The town is governed by a five-member Select Board supported by a Town Administrator.

### **C. Population Characteristics**

The following table shows that Carlisle's population increased over 32% between 1980 and 1990. Growth slowed starting in the 1990s as the population increased about 13% between 1990 and 2000 and between 2000 and 2010, and then stabilized in the past decade.

<b>Carlisle Population*</b>		
<b>YEAR</b>	<b>POPULATION</b>	<b>DENSITY</b> (people/sq mi)
1900	480	31
1950	876	57
1960	1,488	97
1970	2,871	186
1980	3,306	215
1990	4,379	284
2000	4,923	320
2010	5,602	364
2019	5,335	346

*\*Source, Annual Reports of the Town of Carlisle*

From 1970 to 2000, the percentage of the town's households with children younger than 18 increased from less than 25% to over 45%. By the 2010 census, this percentage had decreased slightly to 42.6%. Between the 2000 and 2010 censuses, the population younger than 18 decreased from 30.1 to 27.4%, and the population older than 65 increased from 8.4% to 12.9% with the median age increasing from 41.9 in 2000 to 46.9 in 2010.

The following table shows 2000 and 2010 age distributions with percent increase or decrease and the projections for 2035. The 2035 projections show the clear trend towards an older population, with the percentage of Carlisle residents aged 65 and older projected nearly to double from 12.9% in 2010 to 23.3% in 2035. As noted above, for small towns such as Carlisle, non-decennial census data is considerably less accurate and is not comparable to the data from the 2000 and 2010 censuses, but the 2015-2019 5-year average from the American Community Survey shows those 65 and older at 19.4% (+/- 2.3%).

<b>Age Distribution in Carlisle 2000 and 2010*, with 2035 Projections**</b>				
<b>AGE (YEARS)</b>	<b>POPULATION 2000</b>	<b>POPULATION 2010</b>	<b>% CHANGE</b>	<b>POPULATION 2035, <i>projected</i></b>
Under 5	340	197	- 42.1	207
5 to 9	439	372	- 15.3	269
10-14	461	455	- 1.3	436
15-19	280	391	39.6	309
20-24	85	140	64.7	104
25-34	213	184	- 13.6	137
35-44	884	517	- 41.5	305
45-54	1033	1073	3.9	1031
55-64	587	898	53.0	1262
65-74	277	404	45.8	916
75-84	81	186	129.6	249
85 and over	37	35	- 5.4	69

*\*Source, U.S. Census Bureau, \*\*Source, Metro Future 2035 Update*

The following table shows that nrollment in the Carlisle Public Schools showed a significant increase in students from 1995 to 2005, but a decrease since then to levels lower than recorded in 1995. The number of Carlisle students in Concord-Carlisle Regional High School (CCHS) has also decreased in the past 20 years, but not to the same extent as in the lower grades.

<b>Number of Students in Carlisle Public Schools*</b>			
<b>YEAR</b>	<b>K-8</b>	<b>CCHS</b>	<b>TOTAL</b>
1975	616	241	857
1980	504	249	763
1985	490	252	742
1990	550	180	730
1995	664	195	859
2000	819	264.5	1083.5
2005	814	312	1126
2010	687	337	1024
2015	620	323	943
2019	608	289	897

*\*Source, Annual Reports of the Town of Carlisle*

### **Employment Trends**

Until the 1950s and 60s, Carlisle was primarily agricultural, with both small farms and a few medium-sized dairy farms. It had two psychiatric nursing homes, a small general store and gas station in Carlisle Center, two or three realty offices, and two banks. Carlisle Center is still home to the realty offices and has a convenience, deli, and beer and wine package store, two insurance offices, a mortgage company, a dentist, a local arts and crafts shop, and an automated banking machine. Scattered throughout town are a daycare center and an extended day program for young schoolchildren, two nursery schools, a research facility in the larger of the two former nursing homes, a car-repair shop, an auto-body shop, and several landscaping businesses. Other small businesses range from a family-run manufactory of handcrafted collectible miniatures to the headquarters of a high-tech research and development consultancy for aerospace and military applications with up to 80 employees in Carlisle. The town still has a few small farming operations (some with livestock including cattle, sheep, goats, or pigs and some growing organic produce) and has a modern medium-sized dairy operation with about 240 dairy cows, a small horticultural nursery, and two ice cream stands—all of which hark back to Carlisle’s agricultural past. In the past several years, increasing interest in locally grown food has resulted in more individual homeowners growing produce, the development of the Carlisle Farmer’s Market, and the establishment of a Community Supported Agriculture (CSA) venture at Clark Farm.

Most residents are employed outside of the community, in neighboring towns, employment centers along I-95 or I-495, or Boston. A high rate of employment and high level of education characterize Carlisle’s labor force. Almost 85% of residents 25 and older have an undergraduate degree or higher.

A little under 10% of Carlisle’s economic base is home-based businesses, including plumbers, carpenters, mechanics, architects, artists, craftspeople, attorneys, consultants, information technologists, accountants, and telecommuters. According to records of the Town Clerk, 88 home businesses were registered as of August 2020; the Clerk notes that some of the businesses registered in Carlisle operate at another location and that there are local businesses such as LLCs that don’t register with the town.

**D. Growth and Development Patterns**

**Patterns and Trends**

Historically Carlisle was an agricultural community. During the last 50 years, the economic viability of most farms became marginal. Some have been protected as open space; others have been subdivided into single-family residential housing. Now Carlisle is predominantly residential, with a collection of buildings that comprise a small service-oriented Center Business District in the Town Center, plus three scattered sites outside the Center that have housed small businesses since the 1930s, collectively known as the General Business District (Map 3).

The number of new residential units in Carlisle has decreased considerably from the 1991 through 2001 average of about 25 new homes per year to the current average of just over 10 per year. It parallels the drop-off in the late 1980s following the rapid development period of 1978 through 1985, when an average of 43 new homes were built in Carlisle each year.

The numbers of building permits issued for new dwellings for selected years are listed below.

<b>New Building Permits in Carlisle*</b>	
<b>YEAR</b>	<b># OF PERMITS</b>
1985	54
1990	13
1995	20
2000	24
2005	21
2010	7
2015	8
2016	10
2017	11
2018	16
2019	9

*\*Source, Annual Reports of the Town of Carlisle*

**Infrastructure**

Carlisle’s major roads radiate from its center. Although none is a major highway, they are inter-community roads. The main east-west road, Route 225, is a popular commuting road. This road and Carlisle’s other through roads are heavily traveled during commuting hours.

Aside from very limited, special-purpose systems (e.g., Council on Aging van), no public transportation is available in Carlisle. The nearest connections to train service to Boston are in Concord (about 5 miles from the Concord-Carlisle border), in Acton, and in Billerica.

In 2008 and 2009, a system of almost 2.5 miles of pedestrian pathways, funded by a 2007 Town Meeting appropriation, was built from the Center along all five major roads to link with the extensive Carlisle trail network or with other notable destinations in town. An additional 0.62-mile pedestrian pathway west of the Center on Route 225 was constructed in 2009 by a developer of a subdivision as part of the subdivision approval granted by the Planning Board, and a similarly generated 0.37-mile footpath parallel to a portion of Cross Street, linking with Town-owned open space parcels was completed in 2014. The regional Bruce Freeman Rail Trail has been completed from Westford through Carlisle and south through Acton into Concord.

No municipal public water system exists in Carlisle. All water is derived from individual wells (some serving enough individuals to require designation as public water systems), most of which are deep wells tapping bedrock fractures at typical yields of 3 to 5 gallons per minute. Given the very rocky terrain, the construction of a water distribution system would be very expensive. Nevertheless, to plan for the needs of potentially denser development or an event of groundwater pollution that might damage supply aquifers, in 2002, Carlisle reserved a water rights area on a portion of the O'Rourke land that was sold to the federal government and incorporated into GMNWR (Map 6). A series of consultants and qualified town citizens developed a water-supply plan for the parcel after preliminary hydrogeologic studies indicated that a public water supply yielding approximately half a million gallons per day could be developed (Water Supply Development Plan, O'Rourke Parcel, Carlisle, Massachusetts, October 2001).

No sewer service exists in Carlisle. The school is served by a sewage treatment plant, constructed in 2005 to replace a failed septic system. Aside from the school and recent larger residential projects, each building site in town has its own septic system. The Board of Health adopted new septic regulations in 2008 that call for smaller systems and encourage "innovative/alternative technologies" or "I/A" systems approved by the Massachusetts Department of Environmental Protection. These changes have allowed some denser development because a single larger system can require less clearing of land for new and replacement systems than multiple individual systems would require. In response to some problems with the first larger residential system, the Board of Health approved some revisions to their septic regulations in January 2019.

### **Long-term Development Patterns**

Current development outside of the Town Center predominantly conforms to the town's 2- and 4-acre zoning. Building lots must either be 2 acres with 250 feet of frontage on a public way or four acres with 40 feet of frontage. The reduced frontage lots, coupled with the opportunity to create common driveways by special permit (wherein several homes are served by a single drive off a roadway), have reduced the visual impact of developments on town ways. The Zoning Bylaws include a Distinctive Structures Preservation Bylaw, allowing barns and other outbuildings no longer in agricultural use to be renovated for other purposes such as office use.

The current special permit exceptions to standard 2- and 4-acre zoning are the Senior Residential Open Space Communities (SROSC), Residential Open Space Communities (ROSC), and Conservation Clusters. These exceptions offer the opportunity to build clusters to serve the needs of senior citizens for smaller housing units as well as clusters solely to preserve conservation values, or both. The most recent senior housing development in Carlisle was Garrison Place, built

in 2019 as an SROSC, with 22 acres preserved as open space and 12 acres used for 16 units of attached housing. The first ROSC, Woodward Village, was permitted in 2019, with more than 32 acres preserved as open space and just under 10 acres used for 18 units of “net-zero-possible” housing. A net-zero building is a building with zero net annual energy consumption, meaning the total amount of energy used on an annual basis is equal to the amount of renewable energy produced on site. A net-zero-possible house is one that is built to be energy efficient enough that the addition of an on-site renewable energy source (such as roof solar panels) will make it a net-zero building.

The 1989 Accessory Apartment (AA) bylaw, which only allowed apartments within the main structure, was amended in 2017 to allow AAs in detached structures as long as the principal structure is at least 10 years old. This provision protects against construction of two new dwellings on a lot while greatly expanding the number of properties that are eligible for an AA.

The slowdown in new building permits, the relatively small reduction in total population over the past decade, and the more substantial reduction in the number of students in Carlisle Schools has raised some concerns about maintaining town services in an efficient manner without unduly increasing the tax burden on residents. This concern is quite a change from the concerns of only a decade ago, when projected population growth was expected to necessitate commensurate growth of the infrastructure and the attendant increase in taxes, possibly including schools, recreation fields, police and fire departments, and town government.

### **New England Landscapes Futures**

The Harvard Forest, with funding from the National Science Foundation, has developed an online resource called the New England Landscapes Futures Explorer (NELF Explorer for short). This tool allows users to explore different possible outcomes based on global trends and local conditions on a town-by-town basis. The scientists, business owners, government officials, landowners, and representatives of non-profits developed and analyzed a set of landscape futures for New England and compared them to “business as usual.” Their hope is that “the results will inform real-world decisions about forest management, land use planning, green and gray infrastructure investment, and setting conservation priorities” ([newenglandlandscapes.org/story](http://newenglandlandscapes.org/story), website accessed January 3, 2020).

The website includes the observation that after 200 years of forest regrowth following colonial deforestation, “the New England states are rapidly losing forest cover due to low-density residential development. . . . The incremental loss of open space is almost imperceptible on a daily basis, yet land use is altering forests and other natural lands in the northeastern United States faster than the effects of climate change.”

Scientists and stakeholders in New England developed four different scenarios describing possible futures—not predictions—meant to be “used to inform decision-making within a range of possibilities.” The four scenarios—alternatives to a scenario based on no changes, just the continuation of recent trends—were dubbed Connected Communities, Yankee Cosmopolitan, Growing Global, and Go it Alone, each based on the interconnection of two drivers of landscape change: *natural resource planning and innovation* and *socio-economic connectedness*. The

former depends on the extent to which governments and the private sector engage in proactive land use planning and investment for land, energy, and water use towards goals of stewardship and sustainability. The latter considers the extent to which socio-economic factors are globally or locally oriented. (Note: Climate change is assumed to exist in all four of these scenarios, but the impacts are expected to be different depending on the citizen and government responses within each scenario.)

If nothing is changed, in the NELF Explorer Recent Trends scenario (based on rates and patterns of change that occurred between 1990 and 2010) the result will be the loss of 1.2 million acres of forest in New England by 2060, reducing forest cover by 4%. In Carlisle, this means that much of the currently unprotected forest in town and in surrounding communities will be lost to low-density development, with some loss of agricultural land and a fragmentation of the natural landscape. (Low density in this context means single-family homes on individual lots as opposed to denser development (apartment buildings, etc.) as found in more urban areas; it does not mean that the housing is necessarily spread out with lots of intervening open space.)

In the Connected Communities scenario, “defined by *high* natural resource planning and innovation and *local* socio-economic connectedness” and characterized by slower population growth with an emphasis on local culture and resources, the result of “smart growth” is a stable population, much less of the unprotected forest in our area will be lost to residential development, the conserved forest areas will be expanded, and agricultural land will increase somewhat.

In the Yankee Cosmopolitan scenario, “defined by *high* natural resource planning and innovation and *global* socio-economic connectedness” and characterized by substantial population growth in the region including climate and economic migrants, the currently unprotected forest in Carlisle and a much larger area around us will be subsumed by sprawling development, and there will be no gain in agricultural land, all of which will be surrounded by residential areas.

In the Growing Global scenario, “defined by *low* natural resource planning and innovation and *global* socio-economic connectedness” and characterized by considerable population growth but minimal local planning to keep pace with expected rapid sprawling development, the outcome in our area will be similar to that of the Yankee Cosmopolitan scenario but with even denser residential development.

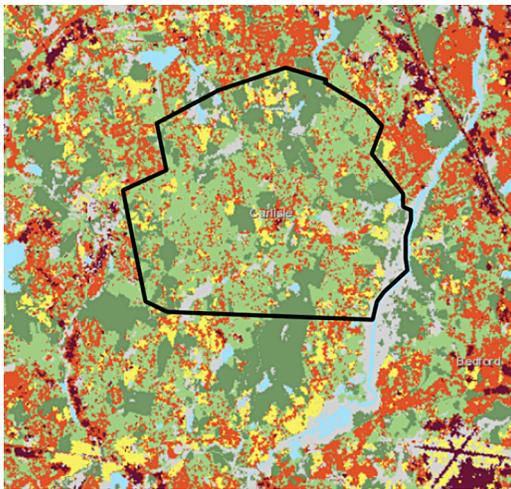
The Go it Alone scenario, “defined by *low* natural resource planning and innovation and *local* socio-economic connectedness” and characterized by low population growth due to the lack of opportunities and the high cost of living, and shrinking budgets that mean little natural resource protection, is similar to the Recent Trends scenario, with portions of the unprotected forest around Carlisle replaced by scattered low-density residential development.

Regardless of the scenario, the NELF Explorer makes it clear that Carlisle is not an island—what happens in neighboring towns and beyond will have a greater effect on our natural environment than what happens within Carlisle’s boundaries. This is not to suggest that what we do in Carlisle isn’t important; rather it means that what we do in Carlisle must be viewed in the context of the communities around us.

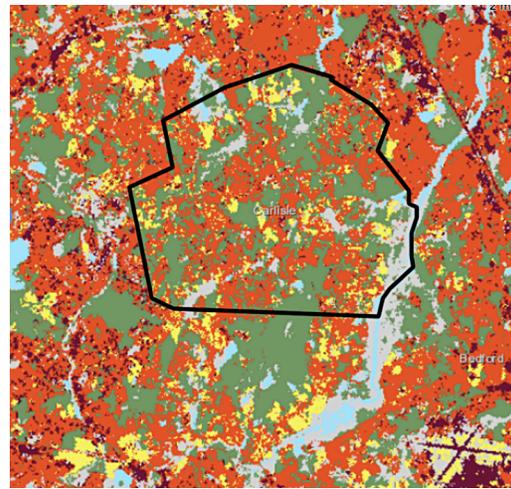
As we have (and will have) limited control over what happens in neighboring communities, we may want to consider worst-case scenarios in the areas around us. This approach suggests that the preserved woodlands, open spaces, and active agricultural land in Carlisle may become an even more important resource as residential development continues to expand into unprotected areas in the towns around us. It also adds credence to Carlisle choosing proactively to be even more of a natural-resource haven than we are now. Rather than resting on our laurels—with 35% of our land permanently preserved, more than 50 miles of trails, and a smattering of active agricultural operations—we should make additional preservation of land in Carlisle a high priority.

Additionally, despite the amount of preserved land in Carlisle, wildlife and other connections among the preserved parcels is dependent on acres of adjacent unprotected woodland and fields. Further residential development in those currently undeveloped, but unprotected, areas will further fragment critical natural habitat.

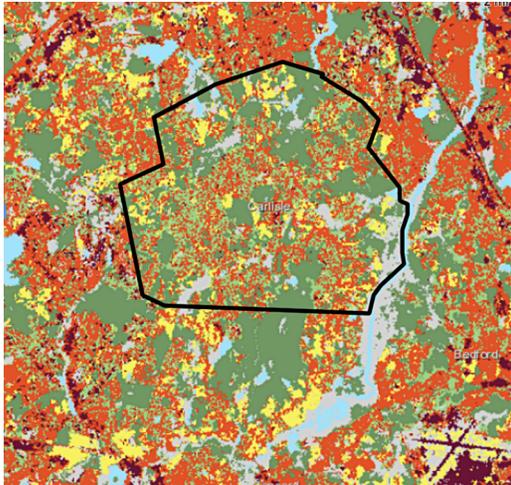
On the following page are screen shots from the NELF Explorer website (with the Carlisle Town border superimposed) showing land use in Carlisle and its immediate surroundings in 2020 and 2060 (based on recent trends) and in 2060 under the four different scenarios described above.



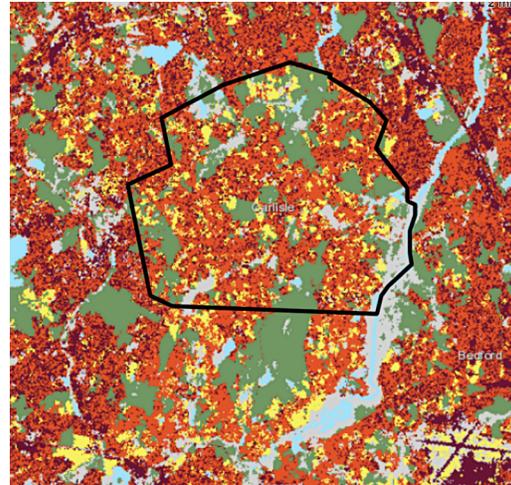
Carlisle 2020 (based on land use trends 1990-2010)



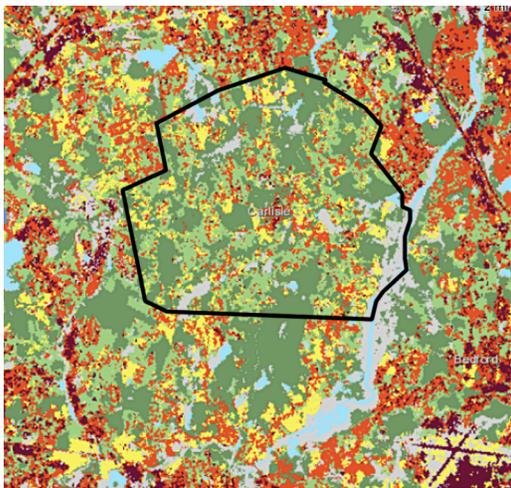
Carlisle 2060 (Yankee Cosmopolitan scenario)



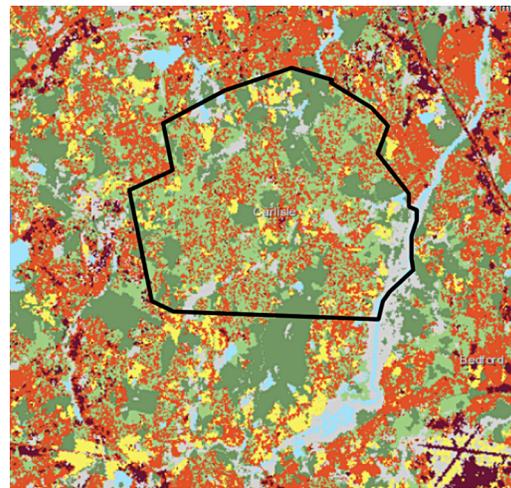
Carlisle 2060 (based on land use trends 1990-2010)



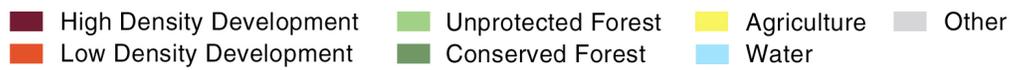
Carlisle 2060 (Growing Global scenario)



Carlisle 2060 (Connected Communities scenario)



Carlisle 2060 (Go It Alone scenario)



## Section 4: Environmental Inventory and Analysis

- A. Geology, Soils, and Topography
- B. Landscape Character
- C. Water Resources
- D. Vegetation
- E. Fisheries and Wildlife
- F. Scenic Resources and Unique Environments
- G. Environmental Challenges



Pink Lady's-slipper  
*Cypripedium acaule*

## Section 4: Environmental Inventory and Analysis

### A. Geology, Soils, and Topography

Carlisle's present topography is largely due to the most recent glacial period ending 10,000 years ago. The great weight of the moving glacier reshaped the terrain, and subsequent erosion, deposition, and the sorting action of glacial melt waters formed today's landscape and soils with underlying granite bedrock. The resulting countryside attracted Carlisle's earliest European settlers to this area, to what is considered to be the first New England inland settlement (then part of Concord). The settlers found streams for fishing and for powering grist and lumber mills, grassy meadows for grazing cattle, and upland forests for harvesting firewood and building materials. Before the Europeans arrived, the Native Americans had long enjoyed the largesse of this bountiful area.

However, the gentle-looking landscape with its rolling hills and wet valleys tested the early settlers. Today's farmers continue to be challenged by sodden fields at spring plowing, hazardous fieldstones pushed up with each spring thaw, hidden rocky ledges that can hang up a harrow, and sandy areas that leach nutrients and water as fast as they are applied. Nevertheless, the soils are generally good, well drained, and moist throughout the growing season.

Carlisle's topography provides a textbook tour of glaciation effects. Moving ice smoothed the hills into their present, gently rounded shapes. Meltwater running beneath the ice carried and deposited coarse sand and gravel in sub-glacial tunnels. These tunnels show themselves today as raised, steep-sided, sinuous natural highways called eskers. Some eskers are visible, running parallel to town roads, as seen along Curve Street; others are hidden in wetlands or woods, such as those in Great Brook Farm State Park (GBFSP). A trail along the top of an esker can provide a walker with a bird's eye view of the surrounding woods.

The glacier also broadened or deepened valleys. Water from Carlisle's three largest watersheds flows into Spencer Brook, Page's Brook, and River Meadow (Great) Brook. The valleys were wide enough to invite damming by early European settlers to provide waterpower for lumber and grist mills. Remnants of millworks are still visible along River Meadow (Great) Brook downstream from the North Road canoe launch, on the Greenough Conservation Land, and on private land behind Kimball's Ice Cream stand on Route 225. The millpond that once powered Robbins Mill is now an expansive, wet meadow that extends from Old Morse Road to Westford Street.

The melting glacial ice left outwash gravel and sand deposits that have been excavated over the years to provide fill for road construction and for sanding cranberry bogs. Numerous glacial erratics, enormous boulders that were carried along by the ice sheet, still sit on top of the ground where they were set down by the retreating ice. A fine example of a glacial erratic is Wolf Rock near the Wolf Rock Road cul-de-sac. There are also many in the State Park and elsewhere around town.

The glacier also left smaller rocks of gneiss, schist, granite, basalt, and quartzite, some carried great distances from where they formed, which the early European farmers wrested from the glacial soil as they cleared fields. They tossed or stacked these rocks to form stone walls or stone

fences that delineated pastureland throughout Carlisle. Many still run along the main and back roads, helping give Carlisle its classic New England character. These stone walls still run in every direction over the landscape, a reminder that, in its agrarian past, Carlisle was once almost entirely cleared of trees. Now, many of the remaining stone walls are tumbled down, overgrown with vegetation, and not aligned with present-day property lines. Over the past 20 years, there have been some problems with people removing rocks from historic stone walls and other structures (and a decade ago, even some ledge) to be used in landscaping projects.

Carlisle has geological deposits that once supported small-scale quarrying and mining. Early settlers found deposits of dolomite limestone, which they quarried and burned in lime kilns to make plaster that can still be found in the walls of some older Carlisle homes. Lime kiln ruins are located off Curve Street and at the intersection of South and West Streets; plaster may still be found in the crevices of these kilns. Another abandoned lime kiln and quarry can still be seen on Estabrook Road in Concord.

Carlisle also had small granite quarries. Rough-hewn granite scraps still lie where they were discarded near those now defunct quarries, as on a small Town-owned parcel along Westford Street near the town line. Quarried granite was used for foundations and for well-crafted stone walls, as visible along Curve Street near Robbins Field. The most ambitious mining operation was the Carlisle Copper Mine, located along Concord Street near South Street. The mine provided fairly high-grade copper ore for a Boston foundry in the mid 1800s. Today, entrances to the mine's 220-foot-deep shaft are plugged with fill and hidden by leaf litter.

Carlisle's soils and geologic features are shown on Map 4. The soils reflect a terrain that was once glaciated. The glacier's grinding action pulverized rock into sand and mud and spread it over the landscape as the glacier advanced. As the glacier retreated, melt waters sorted the particles and stones. In some areas, such as Foss Farm, extensive outwash plains resulted in the sandy deposits in evidence today. In other areas, the mixing of fine particles and stones produced the well-drained, mineral-rich, and moisture-retaining soils that supported Carlisle's early agriculture and nourish its woods, fields, and croplands today.

The soil substrate is a thick layer of hardpan. This hard and stony sub-layer, although difficult to break up with tools, keeps the topsoil moist and relatively rich in minerals. It is responsible for the success of early farming, as well as today's verdant New England landscape. Above the hardpan is a thinner, looser subsoil layer of stones and sand, known as ablation till. On top of the ablation till, organic soil formed from decayed plant and animal matter. Cultivation of cleared land mixed the topsoil with the subsoil. Over time, sub-surface stones were heaved upwards by frost action, removed, and used to build stone walls or discarded in stone dumps.

Some parts of Carlisle have layers of soil that are stained reddish brown from an accumulation of iron oxides and organic acids; these may lead to rust deposits in well water. In Carlisle's wetlands, frequent saturation led to the formation of hydric soils. Anaerobic conditions slow the decomposition of organic matter and result in the deep, characteristic wet muck.

Of the 81 types of soil in Carlisle (Map 4), 14 are classified as prime agricultural soils by the Natural Resources Conservation Service. Prime soils are uncommon in Carlisle; baseline

assessments of some of Carlisle's largest and most significant conservation properties have specifically documented the existence of prime soils on areas of the Greenough Land, Town Forest, Fox Hill, Towle Land, and Cranberry Bog, likely indicating previous agricultural use. Foss Farm does not have prime soils but includes some that are classified as locally important; Foss Farm has historically been farmed and is used today for hay and corn and community gardens.

The soils and geology of Carlisle have had significant effects on development, drinking water, wastewater, and recreation opportunities. Development cannot be sited in wetlands and can be considerably more expensive in areas with much ledge. Carlisle has no municipal water system; drinking water wells must be carefully sited with respect to the soils and geology (particularly the nature of fractures in the bedrock). Carlisle also has no municipal sewer system, so, in addition, all septic systems must be carefully sited, and a reserve area must be designated as a protection against septic system failure. Large, flat sites suitable for playing fields are limited.

## **B. Landscape Character**

On the east side of town, the Concord River forms the boundary line with Bedford. Broad, wet meadows define the floodplain for the slow flowing, meandering river. From the Concord River floodplain on the east and the Spencer Brook floodplain on the west, Carlisle's landscape rises to a maximum of 355 feet, with a mean elevation of 200 feet. Four major hills are 300 feet or higher: Hemlock (Wilson) Hill (355 feet), Heald Road Hill (335 feet), Munroe Hill (330 feet), and Cranberry Hill (300 feet). Minor hills include Bellows Hill, Benfield Hill, and Log Hill (all about 285 feet), and Schoolhouse Hill (260 feet). About half the land slopes in town are less than 3%, and the rest are generally 3% to 8%. Dry land lends itself to development, and, given the economics of development, all dry land in town not under certain forms of conservation protection is considered acceptable for building when in compliance with zoning restrictions and the Wetlands Protection Act.

Due in part to 2-acre zoning, Carlisle's landscape remains semi-rural in character. A few working farms and the protected open space provide field vistas, whereas neighborhood properties have historically been wooded with houses widely spaced. Since the 1990s, developments with larger homes have resulted in more clearing and a more traditional suburban development pattern. The Senior Residential Open Space Community (SROSC) and Residential Open Space Community (ROSC) bylaws, passed in 1994 and 2018 respectively, encourage denser development surrounded by large areas of protected Open Space.

The Town Center with its limited commercial development and small rotary is the geographical hub of the town. Five major roads radiate from the Town Center, including state Route 225. These roads are important commuter routes, with backups at rush hour. With the support of state grants, the Town has completed construction on a redesigned rotary in Carlisle Center to control through traffic better and to promote safer pedestrian crossings among public buildings and the few commercial entities in the Center connected by the pathways system. Carlisle has no traffic signals. Surrounded by towns that are considerably more developed, Carlisle is an oasis of quiet byways good for biking, protected open space for walking, and vistas for sightseeing. The town attracts visitors looking for relief from busier places. Its pleasant landscape also satisfies many of

the passive recreational needs of its own inhabitants. The solace found on Carlisle's trail system, open spaces, and bucolic vistas has been especially important during the COVID-19 pandemic.

Carlisle adopted the state Community Preservation Act (CPA) in 2001. The resulting funds have enabled the Town to protect additional open space (including the acquisitions of the Elliott and Sorli CRs), preserve historic structures (such as the Heald House barn, the church steeple of the First Religious Society in the Town Center, the Cranberry Bog House, and the Highland Building), improve recreational facilities (including a boardwalk through wetlands connecting playing fields, the Banta-Davis fields, and shared facilities at Concord-Carlisle Regional High School), manage conservation land (including removal of Poison Ivy and other invasives from the Towle Land), and improve and extend the Carlisle trail network. These actions have helped maintain the rural character of Carlisle.

Notable areas and sites are shown on Map 5: Unique Features.

## **C. Water Resources**

### **Watersheds**

Map 6: Water Resources outlines the hundred-year flood hazard and wetland areas. Carlisle lies mainly in the Sudbury-Concord-Assabet (SuAsCo) watershed. Within the town, water flows into three streams: Pages Brook runs east into the Concord River, River Meadow (Great) Brook runs north through Chelmsford into the Concord River, and Spencer Brook flows south to the Assabet River (which joins with the Sudbury River to form the Concord River) in Concord. Thus the Concord River provides the ultimate drainage for Carlisle's water on its way to the Merrimac River and, ultimately, to the Atlantic Ocean in Newburyport.

### **Surface Water**

Carlisle lies along the Concord River and is almost entirely bordered on its southeastern edge by Great Meadows National Wildlife Refuge (GMNWR). The entire Carlisle stretch of the river was federally designated as Wild and Scenic in 1999, affording some protections geared to preserving the character of the river. The town has a seat on the SuAsCo River Stewardship Council.

The town also has three major streams: Pages Brook, River Meadow (Great) Brook, and Spencer Brook. Most of the headwaters are in Carlisle near the center, except for one tributary of Pages Brook that starts in Billerica and a major branch of the River Meadow Brook that enters Carlisle from Chelmsford through the Cranberry Bog. Carlisle has no large natural lakes or ponds, but it does have a number of sizeable impoundment ponds formed by dammed streams. Greenough Pond, the reservoirs at the Cranberry Bog Conservation Land, and the ponds at GBFSP are examples on public land.

Surface water recreation areas include the Concord River and several ponds in town. The river is used for boating, fishing, and nature watching. Carlisle does not have a boat launch on the river, but there is one just across the river in Bedford. The Elliott Concord River Preserve provides a canoe landing a short distance upstream of the Bedford boat launch. Greenough Pond is used for ice skating and fishing. There is a canoe launch on Meadow Pond in GBFSP, making the pond accessible for fishing and nature watching. A section of land leading to the Concord River along Route 225 just west of the bridge was given to the Carlisle Conservation Foundation (CCF) by

the Bose family; it provides a clear access point to the river for fishing that is also accessible by vehicles. Carlisle has no public swimming areas.

### **Aquifer Recharge Areas**

Carlisle does not have a municipal public water supply but has several water supply wells designated as public. Most private wells in town are recharged from fractures in the bedrock, a process that provides enough water for residential wells but not for a municipal supply. Some aquifer sites in town may be suitable for public wells for a future town water supply. One high-ranking site is on the former O'Rourke Farm, now owned by U. S. Fish and Wildlife Service. Following extensive investigation and testing, a "Water Rights Area" was identified, and the Town has secured its right to this area for a potential public water supply (Map 6). Another site, with no testing to date, is the Hart Farm property.

Map 6: Water Resources identifies aquifers as having low yield (less than 50 gallons per minute) and medium yield (50 to 300 gallons per minute). The two areas identified as having a medium yield are on the Town's borders (one on the western border with Acton near Westford, the other on the northern border with Chelmsford near Billerica).

### **Flood Hazard Areas**

Map 6 shows the hundred-year-flood hazard zone (A & AE), as established by the Federal Emergency Management Agency (FEMA) and adopted by Town Meeting. FEMA updated the maps in 2013 as the previous OS&RP was being completed; the updated maps were accepted by 2014 Town Meeting and incorporated into the Town's official maps as of July 7, 2014. The map also shows areas of 0.2% chance of annual flood, in other words, areas subject to flooding once every 500 years (FEMA Q3 Flood Zone X).

### **Wetlands**

More than one quarter of Carlisle's surface area is classified by the Massachusetts Department of Environmental Protection (MassDEP) as Wetlands (Marsh/Bog, Wooded Marsh, Cranberry Bog, and Open Water) (Map 6). Most are forested wetlands (primarily red maple swamps), marshes, or wet meadows. The Concord River with its extensive wetland flood plain forms the town's southeast boundary.

Development proposed in or near wetlands and water bodies is regulated under the Massachusetts Wetlands Protection Act (MGL Chapter 131, Section 40) and the Carlisle Wetlands Bylaw. These laws, administered by the Conservation Commission, recognize the important roles wetlands play in protecting the water supply, public health and safety, and the environment. Wetlands filter runoff, remove pollutants, store floodwaters, recharge or discharge groundwater, protect public and private water supply and groundwater supply, minimize storm damage and pollution, and protect fisheries and wildlife habitat. The protection of water quality is particularly important in Carlisle where virtually all homes have individual private wells. The Conservation Commission reviews proposed development projects and issues permits for those that comply with legal requirements.

## **D. Vegetation**

### **General Inventory**

Carlisle's natural vegetation is found in forests and vegetated wetlands. Some meadows and fields survive from early clearing activities, but most open areas progressed to woodland after farming activities ceased. Large areas of fresh water marsh and wet meadow exist along the river and streams. An extensive list of plants can be found in Appendix D.

### **Forest Land**

Most of the town's former farmland is now second- and third-growth forest or has been developed. Mature upland forests are dominated by Eastern White Pine and oak species. Carlisle lies between the largely deciduous forests to the south and the coniferous expanses to the north. Depending on the exposure of the land, north-facing slopes succeed to Eastern Hemlock and northern hardwood climax communities, whereas south-facing slopes succeed to oak and hickory climax communities. Much of the disturbed and sandy soil area is now dominated by Eastern White Pine. Some old fields have succeeded to the pasture juniper stage. Along the Concord River, Silver Maples dominate the forested floodplain wetlands; Red Maples prevail in other forested wetlands. Several areas in Carlisle, such as parts of the Greenough Conservation Land and the Town Forest, were planted in Eastern White pine and non-native Red Pine in the 1930s and 1940s. These plantations remain today as dense, mature, forest monocultures.

### **Public Shade Trees**

Carlisle, until recently a fairly rural and isolated small community, has no shortage of trees. There are, however, several public places that have been planted with ornamental and shade trees. Green Cemetery and Center Park have significant shade trees. The Town Common and Town Hall have trees planted in memory of past Carlisle citizens. The Central Burying Ground, dating from 1782 and in use for about 50 years, has some large trees, the fate of which is yet to be determined as part of decisions to be made with regard to preserving the historic site and some of the old grave markers.

Pursuant to State statute (MGL Chapter 40, Section 15C), Carlisle citizens designated 20 public ways in town as Scenic Roads through votes at Town Meeting in 1973 and 1993. Two more were added to the list at Town Meeting in 2019: Rockland Road and Stearns Street. These Scenic Roads include all the major streets in town except for Bedford Road and Westford Street (Route 225), the one state highway traversing Carlisle. Once so designated, trees and stone walls bordering (i.e., within the right of way of) a Scenic Road cannot be removed without the consent of the Planning Board. In addition, the Commonwealth's Public Shade Tree statute (MGL Chapter 87) designates all trees within a public right of way (whether for a designated scenic road or not) as Public Shade Trees, which cannot be cut, trimmed, or removed without the written permission of the Tree Warden, following public notice and a hearing. Therefore, in Carlisle, removal of any trees on Scenic Roads requires approval of both the Planning Board and the Tree Warden at a joint public hearing. The Planning Board considers requests for trimming or removal of a public shade tree based on criteria in its rules and regulations including preservation of natural resources, environmental values, historical values, scenic and aesthetic characteristics, and proposed compensatory actions such as the planting of replacement trees.

## **Agricultural Land**

In the recent past, Carlisle had commercial poultry, dairy, and pig farms. Today the town has one commercial dairy operation (at GBFSP) and several smaller-scale farming operations. In 2017, the Town included an agricultural questionnaire relating to citizens' food- and animal-raising activities as part of its annual town census. Though not scientific, the survey provided a useful snapshot of the various agricultural pursuits distributed throughout Carlisle. Of the 159 responses, two-thirds reported keeping vegetable plots, with nearly half also harvesting fruits and berries from trees, bushes, and vines grown on their property. Dozens of respondents reported keeping chickens or other poultry, or bees, horses, goats, pigs, sheep, llamas, or cattle, and several landowners had an active woods-management strategy in place, producing fuelwood and some lumber. Over 40 tons of hay and silage were harvested in the preceding year, along with a few small-scale grain harvests.

After more than a century of commercial operation, the Carlisle Cranberry Bog, the last remaining one in Middlesex County, saw its last harvest in 2015. Mark Duffy, who had leased the bog from the Town since 1989, cited economic reasons for giving up; the price of cranberries is too low to cover the cost of raising cranberries, maintaining the dikes, and mowing the perimeter of the fields. A subcommittee of the Conservation Commission spent several years investigating various possible futures for the bog, from growing hay to support the dairy operation at GBFSP to restoring the bog, or parts of it, to its natural state, but as of the date of this plan, no decision has been made. The future of the bog house is also undecided. The building was restored in 2011, and a new well for drinking water was drilled in 2018, both projects funded through the CPA.

Currently, 19 parcels of land, totaling about 346 acres, are in Chapter 61A, the Massachusetts law that provides tax breaks to the owners and gives the Town first refusal rights if the land is being sold and taken out of agriculture.

The continuation of agriculture in Carlisle requires strong local commitment. Clark Farm on Concord Street was purchased in 2010 by Carlisleans Marjie Findlay and Geoff Freeman, who have transformed the former dairy farm into a thriving CSA (Community Supported Agriculture), in which local customers pay in advance for a share of the expected harvest, helping the farm to cover some of the cost of its yearly operations. Farmer Andrew Rodgers moved to Carlisle with his family in 2012 to manage Clark Farm. Andrew was a charter member of the Carlisle Agricultural Commission formed in 2014 and worked on the development of the town's Right to Farm Bylaw passed at Annual Town Meeting in 2019. The farm produces certified organic vegetables and berries and raises lamb, goats, pastured pork, and laying hens. On average, each year, more than 300 CSA members invest in Summer, Fall and/or Winter produce shares with a pick-your-own option in summer and fall, a pick-your-own flower option, and shares in eggs, meat, fish, fruit, and mushrooms produced by Clark Farm and other area farming operations. Fundraising supports sponsored CSA shares for residents of limited means. Clark Farm supplies surplus produce to local food banks and to senior residents at Village Court and Benfield Farms.

The farm operates on approximately 30 acres off Concord Street it owns or leases from the Wilson family and an additional 13 acres on the land of the Seawrights' former daylily farm on Bedford Road (acquired by Marjie and Geoff in 2012). The Bedford Road property includes greenhouses for starting seedlings for the farm, growing cucumbers and tomatoes in the summer (limiting tomato blight problems until later in the season than outdoor-grown ones), and for

growing microgreens and other produce for a winter CSA share. It is also the site of Clark Farm Market, a retail operation selling its own produce plus natural and prepared foods from partner farms and other farm-friendly entities.

As part of its mission to grow community through agriculture, Clark Farm Market makes space available for community gatherings such as a library-hosted reading event, weekly gatherings of groups for families with small children, and evening events with food and wine. Oktoberfest celebrations of the end of the growing season are held most years at the farm.

To further strengthen the community's collective connection to the land, Clark Farm Youth Educational Programs work with several grades of the Carlisle Public Schools and other local school groups to teach the next generation about sustainable agriculture and the food system. Some of the young people who have worked at the farm have gone on to more advanced education and internships towards careers in agriculture. Ensuring that there will be a next generation of farmers—and that there will be land to farm—is the goal of many organizations including the New Entry Sustainable Farming Program (See page 7-4) and Land for Good, a non-profit whose mission is “to ensure the future of farming in New England by putting more farmers more securely on more land.”

Smaller farming operations in Carlisle include Mill Iron Farm on Bedford Road (Dick Shohet tending a small herd of beef cattle for the past 35 years) and Sweet Autumn Farm on Prospect Street (Katharine Endicott growing organic produce for the past decade).

The Foss Farm Community Gardens provide about 100 garden plots for Carlisle residents and others to raise vegetables and flowers, and interest in the gardens has remained strong. The individual plots are easily accessible by automobile and therefore could provide a gardening opportunity for people with some disabilities. Carlisle has had a thriving Farmer's Market offering locally grown produce since the summer of 2005. Markets are held once weekly during the summer growing season; markets are now periodically held in the winter to provide locally produced goods such as meat, eggs, honey, bread, and handcrafts.

### **Wetland Vegetation**

Vegetated wetlands are common features in Carlisle. The town has at least six types as described in “Classification of Natural Communities of Massachusetts” published by the Natural Heritage & Endangered Species Program (NHESP) in 2020. These include Small River Floodplain Forest, Red Maple Swamp, Shrub Swamp, Emergent Marsh, Wet Meadow, and Bog (there are several kinds of the last three).

Wetlands form in areas where the soil is saturated long enough and frequently enough during the growing season that characteristic soils and plant communities develop. They are transitional areas between water bodies and uplands where the plant species gradually change as the ground elevation increases away from the water. Thus, wetlands have no scientific boundaries; these are defined for regulatory purposes.

**Small River Floodplain Forest.** The forested wetlands along the Concord River are dominated by Silver Maple (*Acer saccharinum*) with Buttonbush (*Cephalanthus occidentalis*) and River Birch (*Betula nigra*) present in some areas. In the upper floodplain, Swamp White Oak (*Quercus bicolor*) and Red Maple (*Acer rubrum*) are abundant. The floodplain of the river and its

tributaries provide habitat for the Threatened Britton's Violet (*Viola brittoniana*) and other rare species.

**Red Maple Swamp.** Most of the wooded wetlands in Carlisle, which are seasonally flooded, are Red Maple Swamps; they are abundant near streams and ponds. Red Maples, the dominant trees in the canopy, are easy to spot by their bright red buds, flowers, and samaras in spring and their brilliant fall foliage.

Common shrubs in these areas are Highbush Blueberry (*Vaccinium corymbosum*), Swamp Azalea (*Rhododendron viscosum*), and Sweet Pepperbush (*Clethra alnifolia*). Over the last few decades, many of these native shrubs have been displaced by invasive Glossy Buckthorn (*Frangula alnus*) and Common Buckthorn (*Rhamnus cathartica*).

**Shrub Swamp.** Some wetlands dominated by shrubs can persist for centuries. Others transition to forested wetlands. Dominant species are often alders (*Alnus spp.*), willows e.g. Pussy Willow (*Salix discolor*), and dogwoods e.g. Silky Dogwood (*Swida amomum*). An example is the Spencer Brook wetland around the viewing platform on the Benfield Conservation Land.

**Emergent Marsh and Wet Meadow.** Marshes and wet meadows have primarily herbaceous plant communities. Both have numerous species of grasses (*Poaceae*), sedges (*Cyperaceae*), and rushes (*Juncaceae*).

Marshes have shallow running or standing water during the growing season. Many are found along the edges of streams or ponds. There are good examples along the ponds at Great Brook Farm State Park. Common plants in Carlisle's marshes include cattails (*Typha spp.*), water lilies (*Nymphaea and Nuphar sp.*), Pickerel Weed (*Pontederia cordata*), smartweeds (*Persicaria spp.*), and duckweeds (*Lemna spp.*).

Wet Meadows, where the water table is at or near the soil surface most of the time, often have Marsh Fern (*Dryopteris thelypteris*), Sensitive Fern (*Onoclea sensibilis*), Swamp Milkweed (*Asclepias incarnata*), and Northern Blue Flag (*Iris versicolor*). The extensive areas on both sides of Westford Road outside Carlisle Center in the low area before the Towle Conservation Land are largely wet meadow.

**Bog.** Carlisle has several natural bogs. There is one in the O'Rourke portion of Great Meadows National Wildlife Refuge and another in the Davis Corridor to the east of Two Rod Road where the Sachs Greenway trail enters, near the trail associated with Woodhaven Farm off Prospect Street. The Threatened Ringed Boghaunter (*Williamsonia lintneri*), which breeds only in bogs, was seen in 2020.

Bogs have little or no streamflow and are isolated from the water table. The soil is acidic and low in nutrients, with abundant sphagnum mosses (*Sphagnum spp.*). The above bogs all have wild Large Cranberries (*Vaccinium macrocarpon*). Other typical bog plants found in Carlisle are Black Spruce (*Picea mariana*), Tamarack (*Larix laricina*), Highbush Blueberry (*Vaccinium corymbosum*), Leatherleaf (*Chamaedaphne calyculata*), Sweet Gale (*Myrica gale*), and both Round-leaved and Spatulate-leaved Sundew (*Drosera rotundifolia* and *D. intermedia*).

### **Rare Plant Species**

Two Carlisle rare plant species have been documented with NHESP since 1988: Britton's Violet (*Viola brittoniana*) and Climbing Fern (*Lygodium palmatum*). There are historic records of four other rare native plants. Purple Milkweed (*Asclepias purpurascens*), Few-seeded Sedge (*Carex oligosperma*), and

Cornel-leaved Aster (*Doellingeria infirma*) are classified as Endangered; New England Blazing Star (*Liatris novae-angliae*) is a species of Special Concern. None has been reported in Carlisle in more than a century. There is also an historic record of Dragon's Mouth (*Arethusa bulbosa*), a Threatened wetland orchid, which no longer appears on the NHESP Carlisle list.

Six rare animal species are also found in Carlisle. A chart, "Carlisle Rare Species Documented with NHESP," and NHESP Fact Sheets for all Carlisle rare species are presented in Appendix C. Under the Massachusetts Endangered Species Act (MESA), listed species cannot be collected, destroyed, sold, or possessed. The Massachusetts Wetlands Protection Act provides limited protection.

Carlisle's best-known rare plant is Britton's Violet. Listed as "Threatened," it grows mainly in or near the floodplains of freshwater rivers from Massachusetts to the Carolinas. About two dozen sites are known in the Commonwealth. Seven of these sites occur along the Concord River—four in Concord, one in Bedford, and two in Carlisle. Ours are the northernmost known populations of the species. The first, for which NHESP had a historic record, was re-found by Mark Halloran in 1988. Another cluster of the same population was found by Alan Ankers and Steve Tobin in 2017. A second Carlisle population was discovered by Louise Hara in 2013.

The latter two sites were documented with NHESP by Dr. Sally Zielinski of Carlisle who, since 1989, has studied the biology and ecology of the plant, monitored population levels, located additional populations, and developed restoration and management plans for the Concord River sites. Development, habitat erosion by floodwaters, and competition from alien invasive plants and certain native plants are the main threats to Britton's Violet. Local volunteers have helped manage the Carlisle sites by removing invasives and other competing plants.

Climbing Fern is a species of "Special Concern" found in a number of areas around Massachusetts; it is also rare in adjacent states. The plants resemble ivy more than a typical fern and curl clockwise around the stems of other plants or sprawl across the ground. Climbing Fern grows in moist open woods and along stream edges. The species is also known as Thoreau's Fern because he first found and described it in Concord in 1851. The Concord population was re-discovered in 1978. A Carlisle site has been known since at least 1994 and was observed in 2020.

In the fall of 2019, second-year plants of New England Blazing Star were planted in a section of the Foss Farm Conservation Land as part of an effort to preserve the rare composite and increase the numbers of native pollinators. The population was doing well and flowering in August and September 2020; additional young plants were added. Land Steward Warren Lyman assisted with planting and cares for the young plants. This project is led by Dr. Bryan Windmiller of Zoo New England; there have also been plantings in Concord, Lexington, and Boston.

Three other rare plants found in Carlisle have not been formally documented with NHESP and bear further investigation. There are also seven Carlisle vascular plants on the NHESP Watch List of species whose numbers are low. One of these is Butterfly Weed (*Asclepias tuberosa*); a small patch was found at Foss Farm in 2012 and present in August 2020. Dr. Windmiller and his team planted some second-year plants in two areas in September 2020.

A chart, “Other State-Listed or Uncommon Carlisle Species,” is provided in Appendix C (page C-4). Rareness and other features are designated with the species listings in Appendix D.

### **Sites Having Unique Natural Resources**

Carlisle’s natural history resources can be described as significant examples of New England natural history, rather than unique occurrences. Vernal pools are widely distributed throughout the town’s wetlands, as depicted on Map 6.

Map 5: Unique Features shows the salient features of Carlisle’s other significant natural resources. Carlisle Pines is a small stand of impressive ancient white pines. Tophet Swamp is an extensive wooded wetland that features in early colonial New England legends. Glacial features include Wolf Rock, a large glacial erratic, and various glacial eskers. Castle Rock is a huge outcropping on the Conant Land, long popular with Carlisle’s children. Greenough Pond is an impressive scenic water body. Greater Estabrook Woods, with its surrounding properties protected by conservation restrictions (CRs) in Carlisle and Concord, is the most extensive wild forested region in eastern Massachusetts. Spencer Brook has wonderful meadows and a wildlife viewing platform.

GMNWR is a valuable part of Carlisle’s natural lands, bordering the Concord River. The Concord River itself provides extensive riverine habitat, and the portion bordering Carlisle is within the section of the river designated as Wild and Scenic.

## **E. Fisheries and Wildlife**

### **General Inventory**

In the past, Carlisle has sponsored several Biodiversity Days when experts in various fields of natural history have identified and listed as many species as possible in their area of interest on the given day on a parcel of Town-owned land. Records of these biodiversity inventories are on file in the Carlisle Conservation Commission’s office in Town Hall. The bulk of the Biodiversity Days’ activity (which started in 1998) peaked between 2000 and 2005. Since that time, several plant lists have been compiled for selected conservation properties by the Land Stewardship Committee, and wildlife lists have been kept by Carlisle residents. The wildlife and plant lists have been reviewed and updated and are presented in Appendix D. The update for this plan has been painstaking. Sally Zielinski led a working group consisting of herself and Alan Ankers, Judy Asarkof, Tom Brownrigg, Peter Burn, Ken Harte, Kay Hurley, Helen Lyons, Marc Lamere, and Steve Spang. This plan supports the creation of an official repository for recording and updating the biodiversity in Carlisle, with the lists in Appendix D serving as the base documentation. Such a repository could bring together the work already being done by interested and competent parties to track changes over time and to provide a basis for decision-making by any town body.

Carlisle's wildlife includes an abundant number of white-tailed deer and numerous small mammals such as fox, raccoon, woodchuck, opossum, porcupine, skunk, fisher, weasel, mink, beaver, muskrat, otter, bobcat, and coyote. There was a bobcat sighting in 2013 and another in 2018. Black bears were sighted frequently in many locations around town in 2017 and 2018, with a single bear filmed pulling down a bird feeder in September 2020, as their range is expanding from Western Massachusetts to east of Route 495 (with a December 2018 sighting behind the shopping mall in Burlington). Moose sightings are rare, but a young moose was spotted on the Town Common in spring 2019.

Carlisle has a number of interesting insects (Appendix D). Many town residents have developed an interest in dragonflies and damselflies (Odonata) as a result of regular walks led by Alan Ankers of the Carlisle Conservation Foundation and Susan Emmons, mostly at the (former) Cranberry Bog. The Bog is an excellent site for odonate diversity, with over seventy species recorded there in the last decade. Two dragonflies on the Massachusetts Endangered Species List have been recorded in Carlisle in recent years: Mocha Emerald at the Cranberry Bog and GBFSP and Ringed Boghaunter in the Estabrook Woods. Silver-bordered Fritillary, an uncommon butterfly in Massachusetts, is regularly found at the Cranberry Bog.

### **Birds**

Each winter, on the day of the annual Audubon Christmas Bird Count, a group of Carlisle birdwatchers inventories all bird species sighted in the southern portion of Carlisle contained within the Concord count circle, noting the number of individuals counted in each species. The 2019 count included 16 field observers and 20 feeder watchers in Carlisle. Detailed records from 1973 to the present provide data for identifying trends in winter bird populations.

Carlisle's bird life is quite varied, due to a variety of habitats including fields, wetlands, and forests. Pileated Woodpecker, which requires extensive woodlands, is still relatively common. Red-shouldered Hawk and Turkey Vulture are generally uncommon birds that have bred in Carlisle in recent years; both are increasing. Spotted Sandpiper and Killdeer have bred at the Carlisle Cranberry Bog for the past several years, and Yellow-throated Vireo has nested in Carlisle.

A number of Bald Eagles were sighted in Carlisle in recent years, mostly in areas near the Concord River; this species is becoming more common. American Kestrel is declining in Massachusetts in general; it was sighted often in Carlisle and may have bred here recently. Blue-winged Warbler, which is declining due to loss of habitat (It relies on early-successional second-growth areas.) still appears to be breeding in Carlisle. Virginia Rail is found at Spencer Brook on the Benfield Conservation Land and probably breeds there.

American Woodcock is sighted in Carlisle, and annual "woodcock walks" are conducted at Foss Farm to observe them. Ken Harte has led spring bird walks at the Towle Land for the last 48 years, and the Carlisle Conservation Foundation holds spring and fall bird walks at Foss Farm and Great Meadows, Greenough, and the Cranberry Bog.

Eastern Bluebird is now relatively common and is increasing, partly due to nest boxes at Towle Field and Foss Farm initiated by naturalists Don and Lillian Stokes and volunteers in the 1980s.

Many of these nest boxes are still in use by Bluebirds and are also used by Tree Swallows, Black-capped Chickadees, and House Wrens. The number of Bluebirds is increasing, and many of them now overwinter; the 81 recorded on the 2019 Christmas Bird Count was a new high. Bluebirds also nest in natural cavities such as dead trees (snags). Snags provide good nest sites for other birds such as woodpeckers, chickadees, titmice, and nuthatches.

The Bobolink population on Towle Field has declined for the past few years, mirroring a trend elsewhere in the state and beyond, perhaps due to the incursion of European buckthorn and other woody plants or factors unrelated to habitat in Carlisle. They previously nested at Towle Field every year, but no nesting Bobolinks have been confirmed in Carlisle since 2010. Grassland birds are in general decline, and the loss of nesting Bobolink follows the earlier loss of Eastern Meadowlark as a local nesting species. Efforts have been made to restore the grasses at Towle Field, along with keeping Poison Ivy and invasive Glossy Buckthorn out of the field. Data from the Christmas Bird Count show that Northern Mockingbird has been in decline since about 2003, but the reason for this decline is not known.

Ruffed Grouse and Ring-necked Pheasant have vanished from Carlisle in the last twenty years. Wild Turkey, on the other hand, has become very common.

Carolina Wren and Red-bellied Woodpecker have expanded their ranges northward and are now quite common in Carlisle; they continue to increase in number. Range expansion is encouraged by the increasing popularity of bird feeding. The Carolina Wren population was significantly reduced by heavy winters in 2011 and 2015 but has recovered quickly. Common Raven is increasing and becoming almost commonplace in Carlisle and eastern Massachusetts in general; they are likely nesting in Carlisle. Fish Crow is also more common in the last ten years. Red-headed Woodpecker is rare in Massachusetts but has been found in Carlisle twice in the last twelve years: one was found on South Street in February 2020, following the one on Estabrook Road in 2008.

Nesting boxes for Wood Duck are maintained at the Greenough Conservation Land by the Massachusetts Division of Fisheries and Wildlife. Hooded Merganser, a rare breeding species in Massachusetts, has been nesting in these boxes since 2012.

A Fieldfare discovered on the Greenough Land in 2013 was only the sixth record for the contiguous United States and attracted birders from across the country during the week it was present in Carlisle.

The species list for Carlisle in Appendix D includes some additions from a review of historical records and some species not previously recorded in Carlisle. Black Vulture, another southern species extending its range northward, was sighted at the Maple Street bridge on the Greenough Land in May 2016, and Gadwall was found at the same location in 2012. Greater Scaup in April 2014 and Black Scoter in October 2017 were both found at the Cranberry Bog, the latter having been relocated there by a concerned citizen who found it on Indian Hill Road. Red Crossbill was sighted at a feeder in January 2013, part of an irruption of winter finches that year. (An irruption is a large migration of birds to an area where they are not usually found.) A Bullock's Oriole, a western relative of the Baltimore Oriole, appeared on Fiske Street in

November 2013. A Yellow-throated Warbler, typically rare this far north, was found at the Greenough Land in April 2015. Most recently, some Glossy Ibis were spotted on Nowell Farme Road in April 2020.

### **Vernal Pools**

Carlisle contains many vernal pools, and 78 at the latest count—over half of which were documented and submitted to NHESP by Tom Brownrigg—have been certified by NHESP and receive limited protection under the state Wetlands Protection Act and Title 5. See Map 6 for the latest mapped locations of the vernal pools.

An effort is ongoing to identify and certify more of the vernal pools in town, especially those in areas vulnerable to new development. Each year, the Conservation Commission and Trails Committee host a walk for families to a vernal pool where a specialist in vernal pools informs the participants about the unique role vernal pools serve in wildlife biology.

In Carlisle, obligate species found that allow for vernal pool certification include wood frog, mole salamander, and fairy shrimp. Obligate species can only breed in vernal pools since these are free of fish, which prey on the eggs and young of amphibians. NHESP also allows certification based on breeding evidence of facultative amphibian species, such as spring peepers and American toads. Facultative species breed in vernal pools but also other places. Breeding evidence of two facultative species and evidence that the pool dries up seasonally are required for certification of a pool.

Vernal pools that are not certified—but meet the NHESP certification guidelines—can be protected if evidence of breeding is provided to the Conservation Commission. In this case, the Commission may condition a project to protect the wildlife habitat value of the vernal pool.

### **Corridors for Wildlife Migration**

Carlisle has successfully and permanently protected numerous large parcels of land that both support significant wildlife populations and provide passive recreation opportunities. Carlisle encourages wildlife corridors by promoting linkages between protected lands that additionally provide trail connections for people. An important corridor along the Concord River with linked trails is formed by the contiguous protected properties of the Town Forest, Heidke Conservation Land, Greenough Conservation Land, GMNWR, and Foss Farm Conservation Land, resulting in almost 2 miles of corridor across undeveloped land and totaling well over 1 square mile in area. This corridor will be expanded by 38 acres through the anticipated deeding to the Town of the Open Space required by the Residential Open Space Community development on the former Woodward/Doutriaux Land (#3 on the Protection Priority List in the 2013 OS&RP) that borders GMNWR and the 6 acres of the former David Woodward property (#9 on the Protection Priority List in the 2013 OS&RP) that the Town acquired in 2017.

The Greater Estabrook Woods to the south (extending into Concord) and GBFSP to the north also provide large and relatively unbroken wildlife corridors, both areas containing extensive and heavily used components of the Trail System.

A corridor on the western edge of town—including CRs with both private and public access, publicly owned protected open space, and trail easements—is more fragmented than the corridors

noted above, but a spur trail in the southwest corner of Carlisle now connects Marion's Trail in Ben's Woods to Acton's Robbins Mill Conservation Land and thence to the Spring Hill, Nashoba Brook, and Camp Acton Conservation Lands, the four contiguous parcels totaling over 500 acres, Acton's largest protected natural area.

The Tennessee Gas pipeline enters Carlisle from Westford just north of Carlisle Pines State Forest, goes under the Cranberry Bog (hence the Bog's Pipeline Trail), then hugs Carlisle's border with Chelmsford along the northern edge of Great Brook Farm State Park, and finally goes into Billerica. This 50-foot-wide easement—mowed periodically by the pipeline company to keep brush from making it inaccessible for inspections and possible repairs—provides a more than 5-mile long corridor for wildlife as well.

Section 7 includes more details about additional linkages needed for more extensive wildlife corridors in Carlisle.

Corridors also foster vigorous native plant communities.

### **Rare Animal Species**

Two rare insects have recently been found in Carlisle: the Mocha Emerald (a dragonfly) and the Twelve-spotted Tiger Beetle. Both are species of Special Concern under the Massachusetts Endangered Species Act (MESA). With these two insects, the number of vascular plants and animals documented with the state Natural Heritage and Endangered Species Program (NHESP) is twelve. The list includes three reptiles and an amphibian. A thirteenth species, the Ringed Boghaunter dragonfly, is in the process of being documented.

Jason Forbes, a naturalist from Waltham, first identified the Mocha Emerald (*Somatochlora linearis*) in 2014. It has now been observed in two Carlisle locations, most recently by Alan Ankers in 2019. The species hasn't been reported in adjacent towns. Ankers, who accompanied Forbes, says they may not be as rare as originally thought, now that people are looking for them more! The Twelve-spotted Tiger Beetle (*Cicindela duodecimguttata*) was found in 2015, also by Forbes. It had been identified in Westford the previous year.

The Ringed Boghaunter (*Williamsonia lintneri*) was photographed by Lisa Deupree in the spring of 2019 near a boggy area – and identified by Ankers, who observed several individuals and thinks there may be a breeding colony. This tiny 1.5-inch-long dragonfly is one of the rarest in North America. Forbes has been documenting these finds with NHESP.

One of the MESA-listed species, the Blanding's Turtle (*Emydoidea blandingii*), is listed as "Threatened" and has been the focus of activities at the Carlisle Public School funded by the Carlisle Conservation Foundation for more than seven years. This project of Zoo New England, led by Dr. Bryan Windmiller, includes tracking and monitoring individual turtles and having students raise hatchlings for nine months before releasing them into the wild. Blanding's turtle is one of the most threatened species in the northeastern United States; populations are also known in all abutting towns except Acton.

Three other rare animals are listed as Species of Special Concern: the Blue-spotted Salamander (*Ambystoma laterale*), Wood Turtle (*Glyptemys insculpta*), and Eastern Box Turtle (*Terrapene*

*carolina*). There are several Blue-spotted Salamander populations in Carlisle; it is also found in all abutting towns. The Wood Turtle has been documented in all surrounding towns except Billerica. According to NHESP, the last Eastern Box Turtle reported in Carlisle was in 1988; it has been found in four surrounding towns since 2004, most recently in Billerica in 2016. A sighting near Curve Street in late 2013 has not been officially documented.

A chart, “Carlisle Rare Species Documented with NHESP,” and data sheets for each are provided in Appendix C (page C-4). Numerous Carlisle animals, though not rare, are sufficiently uncommon to be included in the State Wildlife Action Plan. Examples are the Eastern Ribbon Snake (*Thamnophis sauritus*), Broad-winged Hawk (*Buteo platypterus*), and American Black Bear (*Ursus americanus*). A chart, “Other State-Listed or Uncommon Carlisle Species,” is provided on page C-4. Rareness and other features are designated with the species listings in Appendix D.

The 2017 Natural Heritage Atlas, 14th Edition, shows three Estimated Habitat areas for Rare Wetland Wildlife in town: two along the Concord River (north and south of Bedford Road) and one along East Street. Priority Habitat for Rare Plant and Animal Species has been designated in two areas: a small section along the gas pipeline off Acton Street and an extensive area near the Concord River. Priority Habitat areas are considered good habitat for multiple rare species.

Carlisle has significant acreage classified as Core Habitat by BioMap 2. Core Habitat includes key areas that are critical for the long-term persistence of rare species and other species of conservation concern and areas that have a wide diversity of natural communities and intact ecosystems. Carlisle’s (and neighboring communities’) Core Habitat is shown on Map 1. Carlisle also has significant areas that rank in the top 50% of the Conservation Assessment and Prioritization System (CAPS) Index of Ecological Integrity for “Forests” and “Freshwater Wetland & Aquatic” and in the top 40% of the CAPS Habitat of Potential Regional or Statewide Importance.

### **Fishing and Hunting**

According to the 2011 *Conservation Status of Fish, Wildlife, and Natural Habitats in the Northeast Landscape* report from The Nature Conservancy, “The region contains over 200,000 miles of streams and rivers supporting over 1,000 aquatic species, including 300 types of fish. The majority of the region’s watersheds still retain 95–100 of their native fish species, but are also home to up to 37 non-indigenous species.” There is no recorded occurrence in Carlisle of any threatened, endangered, or special-concern species of fish, as listed by NHESP.

Anglers in Carlisle have the opportunity to catch many different types of fish, by spinning, fly fishing, or baitcasting methods. Most fishing requires some type of license in accordance with Mass Wildlife regulations. In Carlisle ponds, the most predominant fish are largemouth bass, northern chain pickerel, crappie, and various species of sunfish. Some ponds also have catfish. These fish are found in the ponds at GBFSP, accessible from the canoe launch, and in Bates Pond, Greenough Pond, and Buttrick Pond.

MassWildlife stocks River Meadow (Great) Brook with brown trout, which are water-temperature tolerant, and rainbow trout. The most abundant fish in the Concord River are carp, largemouth

bass, northern chain pickerel, crappie, and sunfish. Catfish may also be found in the Concord River. Northern pike, which can get quite large, are also caught in the Concord River. Signs near the Concord River warn fishermen not to consume the fish due to high levels of mercury.

There is a canoe launch just across the Concord River off Route 225 in Bedford and a landing downstream at the Elliott Concord River Preserve on the Carlisle side. At GBFSP, Meadow Pond has a canoe launch. In GMNWR, fishing is allowed from boats on the Concord River and from riverbanks in accordance with state regulations. However, no fishing is allowed from any refuge pond or impoundment.

Hunting is not currently allowed on Town-owned conservation land. Bow hunting for deer was allowed in 2018 and 2019 via a limited number of permits granted by the Town, with detailed restrictions, on selected Town- and CCF-owned conservation lands. The deer hunt was controversial, so the Select Board decided in July 2020 to suspend the hunt and place the question before Town Meeting of whether or not to allow hunting on public land. Limited types of recreational hunting (such as bow hunting for deer) are allowed on private parcels with the permission of the owner and a valid Massachusetts hunting license. The U.S. Fish and Wildlife Service allows limited hunting on GMNWR for white-tailed deer (archery only) and waterfowl (ducks and geese). All hunters are required to have a refuge-issued permit along with state licenses in their possession to scout or hunt on any refuge. Not all parts of the refuge are open for each hunt season. Hunters should be familiar with the hunt maps and regulations to ensure they are hunting in an open area and at the correct time.

At GMNWR, hunters are not allowed to access the refuge from Town of Carlisle conservation lands. Parking is available off the driveway at 342 Maple Street, Carlisle. Hunters are expected to be courteous as this is a private residence.

## **F. Scenic Resources and Unique Environments**

### **Scenic Landscapes**

Carlisle's open space includes many scenic areas. People driving through town along main roads see rural vistas of field and forest, old stone walls, and a Town Center that epitomize a small New England town. Open fields, bogs, meadows and forest boundaries, agricultural land, and roadside forest frontage all contribute to the rural character of Carlisle and are highly valued by town residents. Vistas provide a sense of openness and varied land use that distinguishes Carlisle from other more developed communities in the region. In addition to spending time on conservation lands, residents can appreciate many parcels from the road—for instance, the Towle Land and Bisbee Land, both with views across the fields and to forest frontage. By contrast, some parcels that are extensive and provide linkages and habitat value have little road frontage or vista. An example is the Davis Corridor off Bedford Road.

Vistas can be categorized according to the following scheme.

- External (views into a property from a road, public space, or adjacent private property)
  - From major roads such as Route 225 (Bedford Road and Westford Street), Lowell Street, Concord Street, East Street. These roads provide motorists, cyclists, and walkers, both resident and non-resident, with significant vistas.
  - From minor roads with significant traffic such as Curve, Fiske, West, and Maple Streets
  - From abutting private property
- Internal (views within a property)

These can include a mix of fields, edges, forests, ponds, wetlands, stone walls, and structures. Examples of significant interior views include views across the Cranberry Bog to the open water and forest edge, views across Towle field to the forest boundary and stone walls, interior woodland views in the Town Forest, and interior views toward the barn at Greenough. Carlisle's conservation lands have many unique interior vistas, all part of the outdoors experience.

Vista maintenance, preservation, and enhancement are important considerations for conservation land and can include the following.

- Prohibiting or limiting additional structures or structures that are incompatible with the view (Structures include both buildings and fences.)
- Preservation or restoration of historic structures such as stone walls, barns, water features, and foundations
- Removal of vegetation that obscures views into a property, especially from major roads such as the view from Bedford Road into the south (upper) field of Foss Farm and into Fox Hill, the view into Towle Field from Westford Street, and the view into the Bisbee Land from Concord Street

Visitors to GBFSP can view and tour the operating dairy farm, picnic by the fire pond, enjoy ice cream from the stand, canoe in Meadow Pond, or walk, run, bike, horseback ride, dog walk, or cross-country ski along trails winding through the farm, fields, and woodlands.

At the nearby Carlisle Pines section of GBFSP (at the end of Forest Park Drive or Barnes Place), people can walk among several towering virgin pines and hemlock trees with heights over 100 feet and that may have already been mature at the time of the Revolutionary War. These trees remain from a patch of forest that was saved from logging in 1901.

Anyone passing Carlisle by boat or canoe on the Concord River can see the natural vistas along the GMNWR land and the Town's Greenough Conservation Land.

People who walk the town's conservation lands can explore ponds, wetlands, geological outcroppings, woodland trails, and gently rolling fields.

### **Major, Characteristic, or Unusual Geologic Features**

The topography of Carlisle includes features formed by the last glacier (Map 5: Unique Features). People exploring the public lands of the town can observe excellent examples of glacial eskers

and erratic boulders (GBFSP), impressive ledge outcroppings (Conant Land), and undisturbed riverine environment (GMNWR, Elliott Concord River Preserve, and the Greenough Land).

### **Cultural, Archeological, and Historic Sites**

Along many roads and scattered through the woods are miles of old stone walls and the occasional stone foundations of Colonial- and Federal-era homes or mill sites, reminders of the town's earlier inhabitants. An old Indian grinding stone located in GBFSP is only one of several sites around town that have been investigated as potentially having pre-Colonial historical importance. Other sites attesting to the presence of Native Americans are on Foss Farm (arrowheads from the area are in the collection of the Carlisle Historical Society) and Towle Field (including Turtle Rock, a large turtle effigy). An historic lime kiln and lime quarry have been protected in the western part of town.

The Town of Carlisle, through its Community Preservation Fund, undertook a survey to document Carlisle's historic heritage. A preliminary survey plan for the town, completed by preservation consultants in 2006, provided guidance for the "Carlisle, Massachusetts, Historic Properties Survey Final Report," completed in 2010. This survey project was the first comprehensive effort to record the town's historic, architectural, and cultural resources. A total of 220 Massachusetts Historical Commission (MHC) historic-property inventory forms were filled out by the consultants, covering individual historic buildings, cemeteries, areas, landscapes, objects, and structures. The survey included identification of the majority of Carlisle's historic resources before 1960, establishment of a historic context for the town's development (particularly its agricultural landscape), and evaluation of the identified resources according to criteria for the National Register of Historic Places (NRHP). The survey resulted in a list of properties and districts recommended as eligible for nomination to the NHRP. The survey report also outlined further preservation actions to be undertaken concerning documentation and survey work, the adoption of a demolition delay bylaw, the restoration and rehabilitation of significant buildings and landscapes, and GIS mapping of historic properties.

A Historic District in the Town Center was designated in 1969 (Maps 5 and 11). The Carlisle Historical Commission must review and approve any significant externally visible changes to properties in this district. The Historical Commission has published guidelines and application forms, which are available at Carlisle Town Hall and on the Town website.

### **Unique Environments**

Although Carlisle's topography is somewhat typical for the region, the town is home to many species of rare plants and animals and features a small, protected stand of virgin white pines and hemlocks in Carlisle Pines State Forest (Map 5). The large amount of protected land kept in natural condition and lower-density development provide additional potential habitat for rare species.

The Cranberry Bog is an unusual feature in Carlisle (Map 5). It is no longer in commercial operation. Future uses of the bog are currently under consideration. A revised maintenance agreement for 2021 calls for mowing weeds and brush across the bog and trails, removal of debris as needed from water-control structures, routine maintenance of the bog dams, and maintenance of the grounds of the bog house.

Carlisle has an exceptional trail network, with more than 60 miles of protected and maintained hiking trails on public lands and easements on private lands. Recent improvements include the placement of benches for resting and enjoying scenic views along many well-traveled trails. Much work remains to be done to preserve important sections of the trail network that lie on unprotected land. The Trails Committee publishes a *Trails in Carlisle* guidebook, extensively updated in 2018, that features maps of trails throughout town, including the locations of new trail intersection signs that incorporate artwork by students at Carlisle Schools. The trail network is shown on Map 10.

## **G. Environmental Challenges**

### **Environmental Equity**

Protected open space is distributed evenly throughout Carlisle. Similarly, Carlisle's extensive trail network extends throughout the community. Carlisle's small size and relatively even distribution of homes throughout this almost exclusively residential community means that no residences are far from the valued environmental assets in town including open space, park areas, and recreational facilities. Appendix F identifies issues related to handicapped accessibility, recent efforts to improve accessibility, and the areas where further progress is needed. Aside from this identified need to improve handicapped accessibility, Carlisle does not have any significant environmental inequities to address.

### **Hazardous Waste**

All known hazardous spills have been addressed. In late 2018, after the removal of two underground fuel tanks at the Fire Station, hydrocarbon contamination of the ground was discovered. An environmental engineering firm—acting as a Licensed Site Professional (LSP) under MassDEP regulations—engaged to do testing of the site and neighboring wells, found that the contamination was limited and did not require extensive site-cleaning work. Another underground tank on the same site was unearthed in 2020 and decommissioned in place. Further analysis has been completed by the LSP, no material contamination was found, and a report has been filed with MassDEP. The three fuel tanks have been replaced by a single above-ground double-wall tank with a catch basin to contain any spill. The fuel is only for the fire station generator, with all refueling of Town vehicles centralized via an above-ground tank at the Department of Public Works (DPW) site.

In 2019, the hydraulic system failed in the elevator in the Carlisle Schools' Corey Building. About 40 gallons of hydraulic oil were mopped up as part of immediate remedial work at the end of June 2019. Further testing found trace amounts of contaminants in the school's well, although it was surmised that these may not have been related to the leak of hydraulic fluid. Water from other municipal sources and bottled water were supplied to the school until a water-filtration system that treats water at the point of entry, including filtration for uranium as required by MassDEP, was installed and approved for operation in October 2019. During the testing, low levels of radon were detected, so a radon filter was also installed. The elevator itself was repaired early in 2020.

In June 2020, Clean Harbors, an oil recycling facility, reported that oil from Carlisle's waste oil tank at the Transfer Station had tested positive for PCBs (polychlorinated biphenyls). It is not

known how the contamination occurred as the locked tank is only supposed to be opened by a DPW attendant. Carlisle accepts waste engine and transmission oil, but not gasoline, kerosene, antifreeze, and brake fluid. The Town is subject to fines for the contamination. Waste oil is currently not being accepted at the Transfer Station.

In 2017, after years of site cleanup and remediation of the MTBE (methyl tertiary-butyl ether) contamination in the groundwater in the Town Center from the former gas station, an environmental engineering consulting firm concluded that the site exhibits a “condition of no substantial hazard” and recommended a plan of monitored natural attenuation. A final Phase II Comprehensive Site Assessment and a Phase III Remedial Action Plan were submitted to MassDEP. Monitoring of groundwater in nine test wells, including three located in Carlisle Center Park adjacent to the site of the former gas station, will continue until the lingering contaminant levels drop to a point at which groundwater poses “no significant risk.” The plan of natural attenuation will be reviewed every 5 years with status reports submitted to MassDEP biennially.

### **Landfills**

Carlisle has no active landfills. Household waste is collected at the Carlisle Transfer Station on the site of the former landfill and then trucked to the Wheelabrator incinerator in North Andover. Partially in response to increased costs of 20-40% over the next 5 years for each ton of incinerated waste, in 2019, the Household Recycling Committee (HRC) proposed a Pay as You Throw (PAYT) system for Carlisle. By charging for each bag of trash and instituting fees for disposal of large items (from tires to furniture), rather than the current system of an annual sticker allowing unlimited trash disposal, PAYT systems encourage citizens to reduce the amount of trash they generate and to increase recycling. A full PAYT plan has yet to be adopted, but in 2019, the HRC and DPW introduced a composting program whereby household food scraps and other compostable materials are accepted in bins at the Transfer Station. It is estimated that food waste makes up as much as 30% of Carlisle’s solid waste. The materials are collected by Black Earth Compost, a company that processes the waste into soil-enriching compost.

Carlisle has an extensive recycling program. The town separates cardboard, miscellaneous paper, aluminum cans, tin cans, plastic, glass, batteries, compact and other fluorescent light bulbs, building materials, metals, and tires for processing and reuse. As noted above, collection of used motor oil was suspended in June 2020. Elemental mercury is collected and safely disposed of. Batteries, which contain toxic chemicals such as cadmium, lead, lithium, or sulfuric acid, are collected to prevent leaching into the environment and contaminating groundwater. There are hazardous waste collection days. The swap shed at the transfer station, which gives residents the opportunity to pass on goods to other local families, has been closed for much of 2020 due to concerns about viral transmission from the COVID-19 pandemic. The annual Pass It Forward Day and the used book sale at the library provide additional opportunities for used items to find new homes, but both events have been temporarily suspended, again because of the COVID-19 pandemic. In late summer and early fall 2020, two Swap Meets were held on Spalding Field with compliance to COVID-19 safety protocols required.

### **Erosion and Chronic Flooding**

Carlisle has no recognized erosion hazards and no recognized chronic flooding hazards. However, areas of Carlisle are within the 100-year Flood District (Flood Hazard Zone) as delineated by the Federal Emergency Management Agency (FEMA) (Map 6). Incursions of beavers into local wetlands continue to create flooding problems affecting public land, farms, and some homes, including their septic systems or wells. Climate change is likely to cause heavier rainfall events, so the Town needs to monitor aging dams and potential flood hazards. In late August 2020, Carlisle was notified that it had been awarded a \$27,000 Municipal Vulnerability Preparedness (MVP) program grant. The grant will be used to undertake a town-wide assessment of the local risks and hazards of climate change and to solicit feedback from the community regarding the adoption of sustainability goals and incorporating them into future planning efforts. The effort will seek to define local vulnerabilities and to develop actions to be taken.

The state Department of Conservation Resources (DCR) Office of Dam Safety classifies dams as High Hazard Potential dams, Significant Hazard Potential dams, or Low Hazard Potential dams, requiring inspections to be done by qualified engineers at intervals of 2, 5, and 10 years, respectively. The Curve Street dam—a 375-foot long earth embankment (with a controlled-outlet culvert near its center) under part of Curve Street—is classified as a Significant Hazard Potential dam and was inspected in the fall of 2020. Cranberry Bog Dam #1 (perpendicular to Martin Street), a Low Hazard Potential dam, was last inspected in 2015. The dam at Greenough Pond is considered by DCR unlikely to cause downstream damage so it is unregulated, even though its failure would severely impair rare species habitat. It is in need of major repairs; the Conservation Commission expects to seek funding at some point in the near future through the CPA and a state grant to undertake the repairs. Roads over stream crossings are likely to have localized flooding during significant rain events. The DPW replaces aging culverts when time and budget allow. The Planning Board has required modification of public ways to mitigate chronic flooding as part of its permitting for developments with access roads near such locations (for example on Russell Street where a combination culvert/weir was built as part of the Garrison Place development work).

### **Sedimentation**

Carlisle has no major sedimentation issues. From time to time, the Conservation Commission has to address storm-related runoff from construction of new developments.

### **Effect of Development**

Although Carlisle is subject to development pressures as are other towns, some mitigating features are present in this community. Zoning laws enacted to protect groundwater resources by establishing 2-acre minimum lot sizes (1-acre in Town Center) continue to limit the density of new developments but also encourage construction of large homes. The high price of building lots tempts people to tear down older, smaller homes, reducing the inventory of smaller residences in favor of new larger ones.

Although Carlisle is aggressive about protecting wetlands and their buffer zones, innovative alternative technology septic systems are now the norm. This means that parcels once thought to be unbuildable may be (and have been) developed. These systems also allow some of the denser developments described below.

To mitigate concerns about increased density, Carlisle's three zoning bylaws (described below) that allow development denser than what is allowed through Approval Not Required lots and standard subdivisions require set-asides of open space (while also maintaining an average of 2 acres per lot or unit). Under each of these three bylaws, the Open Space must be of conservation, scenic, or historic value and must be deeded to the Town, to a private conservation organization (such as CCF), or to a homeowners' association.

The Conservation Cluster Bylaw, applicable to parcels of at least 10 acres, effectively allows 1 bonus lot and reduced lot shape and frontage requirements for a set-aside of 30% of the total parcel area for open space, no more than half of which open space can be in the Wetlands/Flood Hazard District.

The Senior Residential Open Space Community Bylaw (SROSC), also applicable to parcels of at least 10 acres, allows 1.5 times the number of dwelling units as would be possible in a standard subdivision (but no more units than one half the lot acreage, maintaining a 2-acre/lot average), with restrictions of the size of buildings in the development and number of bedrooms in each unit and requiring at least one resident who has reached the age of 55, for a set-aside of 1.2 acres of open space for each unit.

The Residential Open Space Community Bylaw (ROSC) doesn't have the age-restriction of the SROSC, applies to parcels of at least 14 acres, and allows 2 times the number of dwelling units as would be possible in a standard subdivision (but again no more units than one half the lot acreage, maintaining a 2-acre/lot average), with restrictions of the size of buildings in the development and the number of bedrooms in each unit, for a set-aside of 1.8 acres of open space for each unit.

The denser development encouraged by these bylaws is consistent with smart growth principles, allowing more open space to be preserved and reducing the effects of stormwater runoff and flooding. Table 8 shows the total number of acres of open space created by Conservation Clusters, SROSCs, and ROSCs in Carlisle.

Because Carlisle has a small, limited business center and has little land zoned for industrial or commercial use, businesses in town tend to be cottage industries and limited in size. Opportunity for commercial development in town is limited.

### **Potential for Exposure to Radon**

The nature of the bedrock in Carlisle and its proximity to the ground surface in much of the town presents the potential for exposure to radon. Carlisle is within the zone of highest potential for radon in the EPA Map of Radon Zones for Massachusetts. Radon is a naturally occurring radioactive gas that disperses in the outdoors. When concentrated in indoor environments, radon can lead to adverse health effects. Simple testing can detect the presence of radon, and it can then be controlled with the use of low-cost, proven mitigation techniques.

### **Ground and Surface Water Pollution**

The town continues to use road salt to improve road safety during the winter. Due to a salt storage problem many years ago and the use of road salt, some wells in the Town Center have high salt levels. Road salt is now stored in a covered shed, and the Town applies a non-sodium-based salt (calcium chloride) instead of the standard sodium chloride to the pathways in the center of town.

### **Impaired Water Bodies**

As of 2016, there were no bodies of water *within* Carlisle designated as impaired. The Concord River along Carlisle's border with Bedford (from the confluence of the Sudbury, Assabet, and Concord Rivers to the Billerica municipal water plant intake, north of Carlisle) is listed as impaired with impairments of Eurasian Water Milfoil, Non-Native Aquatic Plants, E. Coli, Fecal Coliform, and Mercury in Fish Tissue. (Section 303(d) of the Clean Water Act requires states to list—and to update the list every 2 years—water bodies that are impaired or threatened by one or more pollutants and which do not meet federal Water Quality Standards.)

### **Invasive and Other Problem Plants**

The number of plant species in Carlisle regarded to be invasive has reached 27, more than doubling those known in 2013. Invasives include three trees, nine shrubs, four vines, and fourteen herbaceous plants. They can variously be found along roadsides, in woodlands, fields and field edges, and in wetlands and water bodies including the Concord River. They are located on private and public lands, including local, state, federal, and non-profit-organization conservation properties.

Among the most widespread and problematic are Glossy Buckthorn (*Frangula alnus*), which is rapidly becoming the dominant shrub in many wooded areas, Oriental (Asian) Bittersweet (*Celastrus orbiculatus*), Multiflora Rose (*Rosa multiflora*), Winged Euonymus (Burning Bush) (*Euonymus alatus*), Black Swallowwort (*Cynanchum louiseae*), Garlic Mustard (*Alliaria petiolata*), and Japanese Knotweed (*Fallopia japonica*). All have been in Carlisle for a decade or more and have been the target of control projects. Purple Loosestrife (*Lythrum salicaria*) has decreased in marshes following introduction of the leaf-eating Black-margined Loosestrife Beetle (*Galerucella californiensis*).

Newcomers to the list include several with showy flowers: Spotted Knapweed (*Centaurea stoebe*), Yellow Iris (*Iris pseudacorus*), and Dame's Rocket (*Hesperis matronalis*). There are also three aquatics: Water Chestnut (*Trapa natans*), Eurasian Water Milfoil (*Myriophyllum spicatum*), and Curly Pondweed (*Potamogeton crispus*). Phragmites or Common Reed (*Phragmites australis*) is spreading on the riverbank adjacent to Foss Farm, at the Cranberry Bog, and in the wetlands adjacent to Spalding Field.

Invasive plants are non-native species that have displaced and replaced native vegetation, often because they have no natural enemies in their new habitat. This change has reduced plant diversity, eliminated food and habitat for native pollinators, birds, and other animals, changed the character of roadsides, altered vistas, and decreased the public's enjoyment of conservation lands.

There are numerous ways non-native plants including invasives reach new areas. Climate change can create favorable conditions for them to expand their ranges. Seeds pass through the guts of birds, are unintentionally transported with goods, or brought in as ornamentals. *Phragmites* has spread along highway drainage ditches. Conservation Administrator Sylvia Willard has observed that areas with particularly dense invasive plant growth are often those where soil fill has been added—both in upland and in wetland replication areas.

Invasive plants, being non-native, tend to have fewer natural enemies to control their growth and spread here than in their original habitats. White-tailed Deer do feed on a number of invasives.

The document “Deer Browse Preferences for Common Indicator Plants in Massachusetts,” provided by the Deer and Moose Project Leader at the state Division of Fisheries and Wildlife, lists several invasive plants, including Multiflora Rose and Common Buckthorn, as “preferred,” which is defined as likely to be browsed at even low deer densities. Other invasives, including Oriental Bittersweet and Autumn Olive, are listed as “moderately preferred.”

The Massachusetts Invasive Plant Advisory Group (MIPAG) considers 35 species as Invasive and another 31 as Potentially Invasive in some or all parts of the state. MIPAG designated species must be non-indigenous to Massachusetts, be naturalized without cultivation, and have the potential for rapid, widespread dispersal and establishment and for existing in high numbers away from “intensively managed artificial habitats.” Carlisle is part of the Sudbury Assabet Concord Cooperative Invasive Species Management Area (SuAsCo CISMA), which has identified 20 Priority Invasives that are “well established” in the watershed and “heavy invaders and resistant to most efforts to eradicate them.” All but three are now on the updated “Invasive and Other Problem Plants: Invasives Currently in Carlisle” chart in Appendix D (page D-55). The list includes species that are MIPAG Invasive and/or CISMA Priority Invasive.

MIPAG has determined 31 Likely Invasive species for the state, and CISMA has identified 16 Early Detection Invasives (EDI) that have been found in the SUASCO watershed or are likely to reach it soon. There is at least one Carlisle observation for seven of these species, including Japanese (Amur) Cork Tree (*Phellodendron amurense*) and Narrow-leaved Bittercress (*Cardamine impatiens*).

While not currently known in Carlisle, an infestation of Mile-a-Minute Vine (*Persicaria perfoliata*) in Westford was caught early. Wild Chervil (*Anthriscus sylvestris*), Wall Lettuce (*Mycelis muralis*), and Japanese Stilt Grass (*Microstegium vimineum*) are in Concord; a small patch of the Stilt Grass was removed a few years ago along a trail in Carlisle’s Greenough Land.

Two related Carlisle plants should also be watched. Although they did not meet MIPAG’s criteria when reviewed in 2015 and they are not on either CISMA list, both are invasive elsewhere. European Spindle Tree (*Euonymus europaea*) is a deciduous shrub historically used to make spindles for spinning wool. Climbing Spindle Tree (*E. fortunei*), also known as Winter Creeper, is a small shrub or evergreen vine that climbs high in trees; it is becoming more common in Carlisle. All are noted on the new “Early Detection: Invasives to Watch” list (page D-56).

The Conservation Commission (ConsCom), its Land Stewardship Committee, and the Carlisle Conservation Foundation (CCF) have collaborated in developing control strategies, spearheading removal projects, and increasing public awareness of the invasives problem.

In mid-2012, funded by a grant from the National Fish and Wildlife Foundation (NFWF) to CISMA, invasive removal projects were completed on the Foss Farm Conservation Land, Towle Field on the Towle Conservation Land, parts of the Ben’s Woods CCF parcel, and the Carlisle (formerly the O’Rourke property) portion of Great Meadows National Wildlife Refuge. Woody plants were cut to the ground by volunteers; then the stumps were individually painted with herbicide by a New England Wild Flower Society (NEWFS) (now the Native Plant Trust) team of licensed pesticide applicators.

According to former Carlisle Land Steward Lynn Knight, the targets at Foss Farm were Oriental Bittersweet, Multiflora Rose, Glossy Buckthorn, and Autumn Olive (*Elaeagnus umbellata*). Removal took place in an area next to the parking lot, along the garden road, and in the field near the river. One section of Buckthorn was 50 feet deep and 150 feet long. The focus on the CCF land was Porcelain Berry (*Ampelopsis heterophylla*) and Oriental Bittersweet in the heavily invaded open areas and Burning Bush (*Euonymus alatus*) in the wooded portion. At O'Rourke, five acres of Multiflora Rose that were over six feet tall were cleared.

Glossy Buckthorn has been problematic in Carlisle for over 20 years. In 1999, there was a major weed-wrenching effort by NEWFS to remove it from the rare state-listed Britton's Violet (*Viola brittoniana*) habitat. It was already widespread in Towle Field. The native Poison Ivy (*Toxicodendron radicans*) has also been spreading dramatically throughout Carlisle for two decades. Its seeds survive passage through the guts of birds that deposit them where they perch on the woody plants, often at the margins of open areas; plants establish and spread into the fields. Poison Ivy is the other serious competitor of Britton's Violet, increasing the need for managing its habitat. It invaded the open areas of Towle Field and vastly reduced the public's enjoyment of walking, picnicking, kite flying, stargazing, and other activities. Poison Ivy is a problem on other conservation properties and along roadsides, impairing the use of these areas for walking and other recreation.

ConsCom has long grappled with Glossy Buckthorn and Poison Ivy at Towle Field, which is an example of the complexities, costs, and challenges of controlling problem plants on conservation land. In the early 2000s, ConsCom received funding from the Natural Resources Conservation Service and CCF to cover several years of sheep grazing on Towle Field. CCF also employed the sheep at its Spencer Brook Reservation. The conclusion was that sheep grazing was not effective in permanently removing Glossy Buckthorn or Poison Ivy.

In 2011, Conservation Commissioner Tom Brownrigg suspected the profusion of these plants, which alter grassland bird habitat, might be the reason no Bobolinks (*Dolichonyx orizvorus*) nested for the first time in over for 25 years. He surveyed the field and determined the densest patches of the two species alone covered 5.5 acres of the field. NEWFS treated the stems of Buckthorn and other woody invasives and Poison Ivy with herbicides in 2013 as part of the CISMA NFWF grant and again under contract the following year. More frequent close mowing by Jack O'Connor has been used, timed to preserve Bobolink habitat.

Since 2015, arborist John Bakewell and Kevin Brown have minimized the Poison Ivy in the field through targeted herbicide spraying; they also tackled Buckthorn and other invasives along trail edges and the parking area perimeter as well as the field. The work was funded through ConsCom maintenance funds and \$14K in Community Preservation Act funds, the latter approved by 2016 Town Meeting. Willard says that Towle Field is "remarkably improved" in 2020. Control efforts will continue with maintenance funding from ConsCom's budget. Currently, in coordination with mowing, the field is regularly treated for Poison Ivy and invasive plants with an herbicide by a licensed pesticide applicator.

Brownrigg said he has seen no indication that the Bobolinks have returned. He noted that grassland bird populations are in decline everywhere due to habitat loss (including on the wintering grounds), predators, and (he suspects) declining insect populations due to pesticide use.

Town boards and committees, non-profits, businesses, and private landowners should be encouraged to take steps to control or eliminate invasive plants on their properties. Bakewell recommends that homeowners undertake search and destroy missions: learn to identify the most common invasive plants, survey their property, including along the road, to locate them, take action to remove them, and recommend doing the same to neighbors and abutters.

Small or young plants, including Buckthorn and Garlic Mustard, can be pulled, especially in the spring. Larger Buckthorn individuals can be extracted with a weed wrench (ConsCom has one to borrow) or hand dug. Repeated cutting of plants like *Phragmites* can be effective, as can covering low or cut plants with mulch or plastic. Careful replacement of disturbed soil and covering the area with leaf litter can prevent seeds or other weeds from growing. Careful disposal of plants by covering and composting or burning, especially if they have fruits, will help prevent spread or regeneration. Poison Ivy removal takes special care to avoid touching the plants; it should never be burned.

Because invasive plants have been found on many sites where work is proposed near wetland resource areas, ConsCom often adds a condition to wetland permits enabling applicants to remove invasive plants in the buffer zone on an ongoing basis by hand or with hand tools. MassDEP now has a Restoration Notice of Intent for a permit under which invasive plants can be removed from wetland resource areas with certain conditions. In general ConsCom approval should be sought before working in or near wetlands. Conservation Commissioner and landscape designer Angie Verge has developed a list of 45 native species appropriate for planting in Carlisle and throughout Middlesex County. These species can replace removed invasives. In 2006, the Massachusetts Department of Agricultural Resources adopted a Prohibited Plant List, last updated in February 2017; the import, distribution, purchase, or sale of these plants, including hybrids and cultivars, is forbidden.

### **Deer**

In recent years, the state Division of Fisheries and Wildlife (MassWildlife) has concluded that the white-tailed deer population east of Route 495 is much higher than what it considers the “healthy level” of 18-20 deer per square mile it estimates for the western area of the state. In 2015, David Stainbrook, Deer and Moose Project Leader of MassWildlife, estimated the deer population density in Carlisle to be between 30 and 60 per square mile. This estimate was based on his and a colleague’s early January walks in Great Brook Farm State Park, the Town Forest, and the Conant Land where they noted browsing on some non-preferred species of plants and several bedding locations in one area (*Carlisle Mosquito*, 21 January 2015. “Would deer hunting cut Lyme rate?” By Helen Lyons).

In 2016, MassWildlife conducted walking surveys on several Town-owned conservation lands (Town Forest, Cranberry Bog, Davis Corridor, Greenough Land, and Towle Land) and the Conant Land. Based on its observations of deer browse of deer-preferred and non-preferred tree seedlings and shrubs and the presence of large stands of invasive species, MassWildlife rated the

properties for forest health. The survey results ranged from the Greenough Land showing “Little to No Impact” to “Moderately Impacted” to the Conant Land as “Negatively Impacted,” with the other properties in between and none categorized as “Heavily Impacted.”

Referencing this study at a presentation organized by the Deer Control Committee in October 2019, Stainbrook stated that the number of deer in a given area is impossible to calculate, but that the number of deer is not important. He stated that what matters is the level of impact on the understory, an important marker for forest health.

Carlisle provides what is considered a near-ideal habitat for deer, with fragmented woodlands interspersed with open areas with an added bonus of tasty plantings surrounding suburban homes. Deer frequent “edge” environments where they can browse in yards and fields and quickly return to the safety of nearby woods. Within forests, they rely on low shrubs and seedlings in the understory, so deer are less numerous in dense mature forests (as may be found in western Massachusetts) where the heavy tree cover limits sunlight reaching the forest floor, thus limiting growth in the understory.

The predominant problems that have been ascribed to overpopulation of deer in Carlisle include a reduction of forest tree seedlings and rare understory plants and wildflowers, destructive encroachment into gardens and vegetable plots, and car accidents associated with deer. Habitats that have been denuded of low-growing plants can adversely affect ground-nesting bird populations and other small creatures needing areas of shelter. Forests with severely degraded understory may take a long time to recover (and only then if causes of degradation and consequences such as extensive encroachment by invasives can be addressed). The annual number of car-deer collisions reported by the Carlisle Police since 2013 varies between 23 and 40, with no clear trend up or down (and no way to know how many collisions may go unreported nor how many collisions result in deer fatalities).

Deer hunting has historically been allowed in Carlisle only on private lands with the permission of landowners and at GMNWR. A 1951 General Bylaw established a prohibition against discharging firearms on public land without the permission of the Select Board and on private land without the permission of the landowner. This bylaw was amended in 1992 to add the word “hunt” to these prohibitions—to include forms of hunting that do not involve firearms such as crossbows and bows and arrows.

From 2000 to 2017, an average of 31 deer were killed by hunters in Carlisle each year, with a low of 20 in 2013 and a high of 41 in 2014. At 2015 Annual Town Meeting, a non-binding resolution requesting that the Select Board (SB) put an article related to bow hunting for deer on Town-owned property at a subsequent town meeting—initially proposed by the Board of Health, advised by their Lyme Disease Subcommittee, as a way to lower the incidence of deer ticks and Lyme disease—passed by a wide margin (350 to 90). Subsequently the SB realized it already had the ability, under the General Bylaws, to permit hunting on public property.

A Deer Control Committee including representatives of the SB, ConsCom, Board of Health, Trails Committee, Police, and hunters was appointed by the SB in 2017. The Committee met over many months and developed bow-hunting regulations, citing forest health and not Lyme disease

as the primary reason for the proposed hunt. (Different studies provide no clear correlation between reduction in deer populations and reduction in Lyme disease occurrence, with some indication that lowering the population to 10-15 per square mile might have an effect, but that level may not be attainable in Carlisle.) In the fall of 2018, a “pilot” deer bow hunt was authorized by the SB on four conservation lands and one municipal parcel. The conservation lands selected for the hunt were the Davis Corridor, Town Forest, and the Benfield and Greenough Conservation Lands. The municipal land selected for the hunt was the Conant Land. Because the conservation lands are under the care and control of ConsCom, they reviewed and approved the regulations. CCF—holder of the CR on the Benfield Conservation Land—also assented to the hunt.

The 2018 hunt was organized through the Deer Control Committee with an appointed local Deer Agent and lasted about 8 weeks (ending 5 weeks sooner than the state deer hunt season). Only bow hunting conducted from tree stands was permitted, a permit issued by the Deer Agent was required, and the hunt was highly regulated. Eighteen hunters selected from qualified applicants received town permits and participated in the hunt. A total of ten deer were killed, eight of those in the Davis Corridor and only five of which were does (killing bucks has minimal effect on limiting deer population growth). With some changes to the regulations to address issues that arose in the first year, the bow hunt was held again in 2019 on the same lands permitted for use in 2018, with a total of just six deer killed, only three of which were does, including one of four killed in the Davis Corridor.

To date, hunting in Carlisle has had seemingly little effect in reducing the local deer population, but alternative control methods including deer contraception, trapping and relocating, and professional culls have been deemed impractical for a variety of reasons including cost, questionable effectiveness, and the perceived brutality of professional culls (which are quite rare in the Commonwealth and require a special permit from the state).

A dedicated group of citizens opposed to the hunt have questioned the basis of the hunt—reduction of the number of deer for the protection of the understory and forest health. They question both the capacity of limited bow hunting to reduce the deer population and the soundness of the data regarding the amount of understory degradation.

State regulations prohibit hunting within 150 feet of a road or within 500 feet of a home without the landowner’s permission, so more than 75% of Carlisle is within this setback. In addition, bow hunting is an inefficient method of killing deer. In a talk in Carlisle in late 2019 entitled “Resolving Suburban Deer Conflicts: Realities and Hopes,” Dr. Allen Rutberg, Tufts Center for Animals and Public Policy at the Cummings School of Veterinary Medicine, was unequivocal in his assessment of the efficacy of Carlisle’s deer hunt (and that of other communities including Dover, Weston, and Framingham). Noting the inefficiency of bow hunting, the limited number of hunters, the limited areas where they are allowed (and thus the amount of surrounding deer habitat on which there is no hunting), and the fecundity of deer, he concluded, “Bow hunting is not going to address deer issues. If you are going to do a bow hunt on conservation land, it is a recreational hunt.... It is not accurate to tell the community that this [the bow hunt] is there to solve the problem. Because it won’t.”

The authors of a 2007 paper in the *Journal of Wildlife Management* entitled “Reduction and Maintenance of White-Tailed Deer Herd in Central Massachusetts,” regarding a successful effort to reduce and maintain the deer population over a large area in the Quabbin Reservation with minimal restrictions on hunters, concluded that a minimum of 30% of the deer herd has to be culled annually to cause a reduction in the deer population the following year. Though the Quabbin hunt has been cited in presentations in Carlisle as an example of successful recovery from understory degradation, the hunt there differs in most all respects from what is possible in Carlisle (large area of unbroken forest, hunting with few restrictions (and with guns), and reports of killing, in some areas, of as much as 50% of the estimated pre-hunt deer population).

Dr. Rutberg agrees with MassWildlife that the only way to measure the effectiveness of a deer hunt is to measure deer impacts, for example, the effects on the understory. Some have noted that the assessments made by MassWildlife in 2016 of Carlisle’s forests were not very rigorous. Budget and staffing constraints limit MassWildlife’s ability to do detailed surveys, so it has developed a protocol for estimating deer browse; the 2016 “Massachusetts Deer Browse Impact Surveys” completed for 6 Town-owned Carlisle properties suggest, however, that MassWildlife didn’t follow its own protocol, which includes the following: “[W]alk through a representative area (10-50%) of the forest to come up with an average level of impact on a property. Avoid areas near trails and roads as these are not representative.” The MassWildlife surveyors appear, based on their GIS-tracking records of their surveys, to have walked primarily on trails for less than a mile in a small northern area of the 247-acre Greenough Land. In the Davis Corridor they again seemed to have stayed on trails, walking no more than 1.5 miles along the western border of the 126-acre property. They seem to have stayed mainly on trails for all their surveys.

Deer have a limited range, so even if one could reduce the deer population on one conservation parcel, this reduction is unlikely to have an effect on others. Bow hunting away from homes and the edges where deer tend to browse will also have limited effect. As Dr. Rutberg noted, “If you’ve got deer going back and forth from the periphery of the conservation land and they are spending some time in the village, then hunting in the middle may not help at all.”

Regardless of the protocol, a survey that looks only for evidence of deer browse will find it in Carlisle. As noted above, residential development surrounded by preserved land comprised of fields and forests creates ideal deer habitat. A healthy New England forest includes deer. The conservation lands surveyed by MassWildlife are not homogeneous; they contain numerous and varied flora distributed unevenly through uplands, wetlands, and everything in between. Some areas certainly do exhibit heavy browsing along the regular trails deer tend to follow as they move into and out of the forest (as indicated by narrow lines of tracks after a winter snow).

To assess fully whether there is a broad degradation caused by deer across Carlisle’s protected lands would require careful observation over many years of significantly more of the land than what was covered by MassWildlife. This full assessment may not be feasible, but, absent such careful observation, there is no baseline to determine the efficacy of any deer-control methods that may be proposed anywhere in Carlisle.

The question of whether or not to continue and even expand the deer hunt (more hunters, more public lands open to hunting, and a longer hunting season) for the 2020 bowhunting season was

debated at length at virtual SB meetings in May and June. In support of an expanded hunt, the chair of the Deer Control Committee stated in early June: “If we don’t continue to increase hunting access now, then the population will continue to rise.” The Deer Control Committee presented a letter of support for deer hunting from the Metrowest Conservation Alliance (MCA) Deer Management for Forest Health Committee. Opponents of the hunt challenged the soundness of the data presented by proponents and expressed fears of being on Carlisle’s trails during hunting season, especially for children and during the COVID-19 pandemic when the trails are receiving heavy use. Citing concerns about the understory, ConsCom and the LSC recommended to the SB that they approve the expanded deer hunt. ConsCom suggested that the Deer Control Committee “further examine the possibilities to encourage the taking of does.” The Trails Committee stated its belief that the regulations under which the hunt is operated allow for safe use of trails during the hunt.

Given the amount of public opposition to an expanded hunt, in June, the Select Board asked the Deer Control Committee to provide an alternate proposal with no net increase in the number of parcels open to hunting or days available for hunting and to require hunters to have an antlerless deer permit. Their proposal, presented in July, included hunting on the Hart/Swanson Land and DPW land in place of hunting on the Greenough Land, citing Greenough’s adjacency to GMNWR, where hunting is allowed. They proposed keeping the previous limit of 18 hunters and requiring at least one antlerless deer permit for each hunter. In support of the non-expansion proposal, the Deer Committee stated that the program run the previous two years, with 10 and 6 deer killed, “was the difference between the population increasing and the population very slightly decreasing or holding steady.” This claim seems inconsistent with earlier statements that only an increased hunt would reduce the population, and with research cited above in relation to the Quabbin hunt that if less than 30% of a pre-hunt population is culled annually the population will not decrease.

In late July, the SB, citing the divisiveness of the issue of deer hunting on public land and the lateness in the year relative to deer hunting season, voted to suspend deer hunting on public land for the 2020 hunting season and to put the question to a future Town Meeting as to whether or not the SB should allow hunting on public land.

### **Forest Pests and Diseases**

The Emerald Ash Borer has likely reached Carlisle. Three other destructive, invasive insects have been here for some time at relatively low but fluctuating levels: Winter Moth, Gypsy Moth, and Hemlock Woolly Adelgid. Needlecast diseases of Eastern White Pines are concerning. The Town should remain on the alert for the Asian Longhorned Beetle, Black Oak Gall Wasp, and Pitch Pine Beetle. All are presently considered threats to forest health by DCR. Two potentially destructive fungi have been found: Honey Mushroom and Coral-spot Nectria Canker. Dutch Elm Disease and Chestnut Blight are likely still present. Population levels and the damage insects and pathogens cause vary from year to year due to weather and other factors. Climate change, which is bringing periods of drought that stress trees and some springs with warmer temperatures and increased rainfall, is increasingly thought to favor certain pests and diseases. Vigilance is key to preventing problems from worsening. Biological controls are increasingly successful; these and other non-chemical solutions should be prioritized. Woody plant and problem insect/disease

identification workshops, volunteer monitoring programs, and other public awareness projects are recommended.

As of March 2020, DCR confirmed presence of the Emerald Ash Borer (*Agrilus planipennis*) in 117 Massachusetts municipalities including Chelmsford (2018), Acton (2019), and Westford (2020). Evidence of the Borer has been observed in felled trees just over the Concord line. This wood-boring beetle's primary host trees are White Ash (*Fraxinus americana*), Black Ash (*Fraxinus nigra*), and Green Ash (*Fraxinus pennsylvanica*). The first two are known to grow in Carlisle. Ashes are also subject to Ash Yellows (*Candidatus Phytoplasma fraxinii*), a bacterial parasite, which has been killing trees in Carlisle and surrounding towns for several decades by disrupting the growth pattern of leaves and branches.

The Emerald Ash Borer reached Massachusetts in 2012. For several years, the U.S. Forest Service conducted early-detection training and studies at the Foss Farm Conservation Land, which has both ash trees and a large colony of the native, non-stinging Beetle-hunting Wasp (*Cerceris fumipennis*). These burrowing, solitary wasps collect adult beetles in the family *Buprestidae* to feed their young; since the Emerald Ash Borer is a *Buprestid*, the wasps are useful in monitoring for its presence. The state Department of Agricultural Resources also conducted bio-surveillance training at Foss for its volunteer Wasp Watchers program. DCR has set out beetle traps in Carlisle. No Emerald Ash Borers were reported.

The half-inch-long, metallic-green adults emerge from overwintering pupae in May and June. Eggs are laid in bark crevices of the host tree and hatch in 7-10 days. Larvae then burrow into the trees where they feed on and destroy the water- and nutrient-conducting tissues of the tree. A severe infestation can kill a large tree in 3-4 years.

All of Massachusetts is part of a national quarantine zone that limits the transport of ash plants, wood, and products. DCR indicates that three biocontrol species are being released in the state with success in controlling the beetles. All are non-native, parasitic, non-stinging wasps: *Tetrastichus planipennis*, *Spathius galinae*, and *Oobius agrili*.

According to UMass, a decline in Winter Moth (*Operophtera brumata*) numbers represents a success story for biological control of an invasive insect. The European import was first found in Massachusetts in the 1990s. By 2005, the larvae were causing severe damage to the buds and young leaves of oak, maple, and apple trees and destroying blueberry crops in parts of eastern Massachusetts. That year, UMass Amherst entomologists began releasing a Eurasian parasitic fly (*Cyzenis albicans*) in affected locations. The fly, which parasitizes only Winter Moth, lays its eggs on leaves where the caterpillars feed. After the moth larvae ingest them, the fly larvae hatch and feed on them internally. By 2018, UMass had released 80,000 flies and had established *C. albicans* at 38 sites.

Winter Moths became very abundant in Carlisle about a decade ago, with their numbers peaking around 2014. Moth expert Dr. Peter Burn of Carlisle has been studying and documenting Winter Moths here for a number of years. He thinks the complete story of variation in moth numbers, including a statewide decline in 2017, is due to a combination of natural predators, possible introduction of the fly, and weather conditions. Numbers he documented here in late 2019 were more than 50% higher than in 2018.

Winter Moths over-winter as eggs, which the wingless females lay in tree-bark crevices. Green inchworms appear in early spring and feed on the buds and leaves of the host plants. They spin silk threads and waft to nearby trees. After the pupal stage in the soil, adults emerge in late fall and early winter. The males are most often seen around porch lights and in headlight beams.

The Gypsy Moth (*Lymantria dispar*) is currently present in low numbers in Carlisle. The most recent outbreak in Massachusetts began in 2015. According to DCR, numbers peaked in 2017 after two seasons of drought suppressed the *Entomophaga maimaiga* fungus, which attacks the caterpillars. Over 923,000 acres of Massachusetts forest were defoliated that year. Infestations occurred in two areas of Bedford, one on the eastern boundary of Carlisle.

High numbers of egg masses were found a few towns away from Carlisle in the winter of 2018-2019. However, the cool, wet spring led to high caterpillar mortality from the fungus and the Nuclear Polyhedrosis Virus (NPV). The current outbreak could be coming to an end.

Carlisle has been on the alert for the Gypsy Moth since at least 1925 when the Town's Moth Department reported a small increase in numbers. After being introduced to Medford in 1869, it had spread to every Massachusetts municipality by 1922.

Gypsy Moths are almost always present in a given area. Their numbers rise and fall, with occasional severe outbreaks. The caterpillars caused widespread forest defoliation in Carlisle in the early 1980s during the largest outbreak in Massachusetts history. White Oak is the Gypsy Moth's preferred host, but the caterpillars feed on other oaks, maples, poplars, apples, blueberries, and many other plants found in Carlisle. Dr. Sally Zielinski, as part of her dissertation research during that outbreak, raised caterpillars on local White and Red Oak, Grey Birch, White Pine, and four species of blueberries and huckleberries. They grew larger and faster on White Oak than the other plants and clearly preferred Lowbush Berry to its relatives.

The Hemlock Woolly Adelgid (*Adelges tsugae*), present in Carlisle for over a decade, was introduced to Massachusetts from an infestation in Connecticut in 1988. This aphid-like "true" bug uses piercing and sucking mouthparts to feed on the sap of twigs of the Eastern Hemlock (*Tsuga canadensis*), which can lead to defoliation and the ultimate death of the tree. Arborist John Bakewell says that, as a result of a mild winter, Adelgid populations are expected to surge in 2020. Kay Hurley observed a relatively heavy infestation in a small group of trees near the edge of Towle Field in June.

This insect has a complex biology, which varies regionally. In eastern North America, the adelgids are all female, thus reproducing asexually. Two generations overlap each year. One generation of egg masses, which look like tiny cotton balls, appears at the base of Hemlock needles beginning in March. The reddish eggs have a somewhat sticky, waxy, wool-like covering and can be picked up and dispersed by animals. The resulting nymphs become winged adults in June and can disperse to other hemlocks. The next generation nymphs are inactive until mid-October; then they feed through the winter as they mature into adults.

In July 2019, UMass indicated that Eastern White Pine (*Pinus strobus*) trees have been experiencing yellowing and browning of needles, premature needle shedding, and other conditions since around 2009. Damage has been observed in Carlisle in recent years. These

conditions are now known to be due to multiple fungal pathogens, climate change, and the native White Pine Bast Scale (*Matsucoccus macrocicatricis*), an insect whose feeding sites allow a pathogen to enter the tree.

White Pine Needle Diseases, or needlecast, considered the major problem, are caused by four fungi. Because the insect and fungi are all native, changing climate is being investigated as a factor. Warmer temperatures and increased rainfall May through July foster these pathogens. DCR reported in May 2020 that White Pine defoliation is being monitored statewide. The most prevalent fungal pathogen in Massachusetts is *Lecanosticta acicula*, which causes brown spot needle blight, which can lead to stunted growth and tree mortality.

Kay Hurley, an expert on fungi and lichens, reports that Honey Mushroom (*Armillaria mellea complex*) is present on the Towle Conservation Land. This fungus spreads through the soil and can affect a wide variety of woody plants, causing “white rot” root disease. Hurley also found Coral-spot Nectria Canker (*Nectria cinnibarina*) infecting American Beech (*Fagus grandifolia*) on the Conant Land and in the State Park. This fungus also damages maples, elms, and honey locusts by killing the bark, inner sapwood, and cambium.

When Dutch Elm Disease was first reported in Massachusetts in 1941, the American Elm (*Ulmus americana*) was a dominant tree in floodplains and also found in upland forests. *Ophiostoma ulmi*, which was later largely replaced by the more aggressive *O. novo-ulmi*, is a fungus spread by two beetles and grafted roots of nearby trees. Towle Field still has several large American Elms, and mature trees are scattered through wooded areas of Carlisle. American Elm is considered highly susceptible to the fungus; Slippery Elm (*Ulmus americana*), now more common here, is less susceptible.

Sprouts from the stumps of American Chestnuts (*Castanea dentata*) are still found in Carlisle. They may do well for years or a few decades until they are attacked by the Chestnut Blight (*Cryphonectria parasitica*). Efforts are underway internationally to find trees and breed hybrids resistant to the fungus.

Three destructive insect pests could potentially reach Carlisle. The Asian Longhorned Beetle (*Anoplophora glabripennis*) is a wood-boring pest that poses a serious threat to New England’s hardwood forests. The first Massachusetts infestation was found in Worcester in 2008. A 110-square-mile quarantine zone has been established covering all or parts of six communities in Worcester County. A second infestation, in 2010 in Boston, has been eradicated. Maples, elms, birches, willows, and many other hardwoods found in Carlisle would be susceptible should the beetle reach here.

Black Oak (*Quercus velutina*) is a common woodland tree in Carlisle. The Black Oak Gall Wasp (*Zapatella davisae Buffington*) has been damaging trees on Cape Cod, Martha’s Vineyard, and Nantucket. The wasp lays its eggs in twigs, causing them to become gnarled and swollen. Several parasitic wasps have not yet reached population levels to be an effective control.

The native Southern Pine Beetle (*Dendroctonus frontalis*) lives in the inner bark of pine trees and is the most destructive pest of pines in the southern U.S. It has been damaging White Pine (*Pinus strobus*) and Pitch Pine (*Pinus rigida*) in parts of Massachusetts for at least five years.

### **Honey Bee Decline**

The Honey Bee (*Apis mellifera*) is a critical pollinator of food crops and other flowering plants. Although the exact number of beekeepers in Carlisle is not known, an active group of residents has maintained hives for at least 40 years. The Middlesex County Beekeepers Association meets regularly in Carlisle during the winter to exchange best practices and other beekeeping information.

A number of Carlisle beekeepers have experienced severe difficulties with survival of their bee colonies since about 2005. In fact, many Carlisle beekeepers lost all or most of their colonies over the winters of 2017-2018 and 2018-2019. Similar losses occurred in Concord over those winters. Carlisle beekeepers report mixed colony-mortality rates this past winter (2019-2020). Several had all their hives survive after a banner honey harvest, a few again lost all their hives (some with poor honey production), and a few had results somewhere in between. A nationwide decline of Honey Bees in this same time frame has been attributed to a malady called Colony Collapse Disorder (CCD), which is a cluster of symptoms, not a specific disease. The causes of CCD are thought to be many—including stress, *Nosema* (caused by a parasitic fungus), viruses introduced via parasitic mite infestations, and pesticides. Some or all of these causes may be operating in any given CCD outbreak.

Low-level pesticide exposure can impair the Honey Bee's immune system and affect colony health. Neonicotinoid pesticides are thought to be particularly devastating, affecting the bees' sense of direction and making it difficult for them to return to the hive. These chemicals are used in grub-control products and on many seed coatings including those of corn and soybeans. About 95% of all US corn seeds have these chemicals, and the National Audubon Society reports that one corn seed has enough neonicotinoid to kill one songbird. Neonicotinoid pesticides are widely available to homeowners and lawn-maintenance services. This class of pesticide has been in wide use since 2005, about when CCD started.

A comprehensive U.S. Government report attributed the rapid decline of Honey Bees to a combination of factors, including parasitic mites, viruses, bacteria, poor nutrition, and genetics, as well as pesticides, but concluded evidence that pesticides are a leading cause of colony collapse is lacking and that more research is needed (*U.S. Department of Agriculture, Report on the National Stakeholders Conference on Honey Bee Health, October 15-17, 2012, Alexandria, Virginia*). The European Union, however, recently extended a two-year ban on neonicotinoid pesticides. Carlisle beekeepers remain seriously concerned about the use of these pesticides. In 2015, the Harvard University School of Public Health published a study of neonicotinoid concentrations in pollen being brought into beehives in Middlesex County. The Harvard study found neonicotinoids in all four hive locations that were monitored in Carlisle at concentrations deleterious to Honey Bees and to bumble bees.

### **Threats to Native Pollinators**

The well-documented decline of Honey Bees has become a major focus of research into the threats posed by pesticides, mites, fungi, and other possible causes of population decline and hive loss. Although non-native Honey Bees are commercially important, native pollinators, such as wasps, butterflies, moths, beetles, flower flies, and the more than 350 bee species native to Massachusetts, are arguably as important to food crops and face threats that may be even more

severe. These threats include loss, degradation, and fragmentation of habitat; the crowding out of native host plants by introduced invasive species; the traditional landscaping practice of installing non-native ornamental plants and expansive monoculture lawns; and air and light pollution. In addition, climate change can disrupt the synchronization between plant blooming time and pollinator emergence, affecting the length of the pollination period and subsequent fruit set.

Native bees and other flower-visiting insects are ecologically important as pollinators of wildflowers and are thus “keystone species”—the decline of which poses a significant threat to environmental health and the loss of which could result in the collapse of ecosystems. However, homeowners can help to restore a safer environment for pollinators by joining environmental organizations, participating in local biodiversity programs, or initiating changes to their own properties that foster these important insects.

The Beecology Project, headed by Dr. Robert Gegear, Professor of Biology at UMass Dartmouth, is working to gather more data about bumble bee populations across as many as a dozen bumble bee species and to identify major stressors threatening some of them. It has developed a Beecology app that allows citizen scientists to upload photos of bumble bees on plants to assist researchers in establishing patterns of foraging and behavior at the species level (<https://beecology.wpi.edu/website/home>, accessed January 6, 2020).

The Pollinator Task Force of the Metrowest Conservation Alliance (MCA) has established a goal of planting 30,000 acres of pollinator habitat in the MCA region (the 36 towns within the Sudbury, Assabet, and Concord River watershed).

The town of Great Barrington in western Massachusetts passed a “Pollinator Friendly Community Resolution” and followed with recommendations for property owners, businesses, and institutions: eliminate pesticide use; avoid flowering plants treated with systemic pesticides; plant more native pollinator-supporting plants; identify potential demonstration sites for model pollinator habitat that will include interpretive signs; identify potential pollinator corridors; and educate the public about the need for action and actions to take. Benefits of the plan include improved water quality, support for ecological diversity (including wild animals higher up the food chain), and local food security.

See pages 7-6 through 7-7 for recommendations for addressing the issues with pollinators identified above.

## Section 5: Inventory of Lands of Conservation and Recreation Interest

- A. Private Properties
- B. Public and Non-profit Properties



*Roadside vista across Towle Field, part of the 121-acre Towle Land, with trails through a rich variety of wildlife habitats, from open field to mixed hardwood forest, past 8 certified vernal pools, and featuring a century-old cow tunnel under Westford Street.*

## Section 5: Inventory of Lands of Conservation and Recreation Interest

As a relatively sparsely populated, historically agricultural community, Carlisle has always been characterized by its open spaces; this quality has been central to Carlisle's appeal to new residents for more than half a century. Today's citizens owe a debt to past town residents who had the foresight to protect permanently the open spaces that were attracting new residents to new housing developments that, if unchecked, would have eventually consumed even more of this precious resource. Today, over a third of Carlisle's land is permanently protected; protection of additional open space remains a goal within Carlisle. Housing development here and even in Carlisle's neighboring communities poses threats to finite groundwater resources, both in terms of quantity and quality (from pollution, runoff, pesticides, and herbicides), especially since Carlisleans rely on individual private wells for drinking water. Additional reasons for further protection of Open Space are highlighted in Section 7: Analysis of Needs.

This section inventories parcels of land of conservation and recreation interest owned by private, public, and non-profit entities and examines the degree of protection afforded to these parcels. It identifies existing open space and recreation properties that are legally protected and lands essential for natural resource or recreation purposes that are not currently protected.

Protected open spaces are lands that are permanently committed for conservation or recreation purposes or both. They include holdings of the Carlisle Conservation Commission (Table 1 and Table 2), the Commonwealth of Massachusetts and U.S. Government (Table 3), and the private Carlisle Conservation Foundation (CCF), The Trustees of Reservations (TTOR), and the Sudbury Valley Trustees (SVT) (Table 4). Protected open space also includes private properties with permanent conservation restrictions (CRs) (Table 5) and open space created by conservation cluster developments (Table 8). Unprotected open space consists of public and private properties that are not designated for conservation or recreation and includes land in Chapter 61, 61A, or 61B (Table 6). These properties are vulnerable to development.

Section A below provides an inventory of significant **private** parcels and ranks them according to how they rate on a scale of community-specific values developed for this plan. Section B provides a descriptive inventory of **public** conservation and recreation resources (including federal, state, and municipal lands), non-profit conservation lands, and other public unprotected lands.

Private and public protected and unprotected open space in Carlisle is depicted on Map 7: Inventory of Open Space.

### A. Private Properties

For the 2020/2021 Open Space and Recreation Plan (OS&RP), an inventory was compiled of private properties of 10 acres or more. The current level of protection of these properties was assessed. The properties were then ranked according to land protection values and criteria established for this plan.

Private properties with conservation restrictions, which are considered to be permanent protections, are shown in Table 5. Lands in Chapter 61, 61A, or 61B are shown in Table 6.

Although Carlisle encourages landowners to place land under Chapter 61, 61A, and 61B, these lands can be easily removed from these classifications and therefore cannot be considered as protected open space. Chapter 61 indicates lands that are declared as managed forest land. Chapter 61A is land that is in agricultural or horticultural use, and 61B is land that is in recreational use or is considered to be of significant value for the preservation of wildlife or other natural resources. Property owners who use these classifications qualify for reduced property taxes on the portion of the property in the specified use. The designated use must be maintained for specified periods of time or back taxes can be assessed against the property. When a property owner notifies the Town that he/she plans to remove land from these classifications in order to sell or to change the use of the land to a residential, commercial, or industrial use, the Town must decide within 120 days whether to purchase the property at fair-market value. However, if the land is removed from Chapter 61 with no change in use for a period of 1 year, the Town then loses this right of first refusal.

Carlisle does not have any private recreation lands such as game clubs, major institutional holdings such as colleges or hospitals, or corporate holdings with recreation fields.

### **Privately Owned, Unprotected Land Inventory**

#### **Ranking of Unprotected Open Space Properties**

Of particular interest to the town are sizeable unprotected properties that would be desirable additions to its protected open space inventory based on established criteria used to evaluate and rank them. The large properties (10 acres or more, including contiguous parcels under common ownership) of unprotected open space remaining in Carlisle are inventoried and ranked in Table 7: Seven-Year Action Plan Private Property Protection Priority List and shown on Map 9: Unprotected Private Properties Priority Rankings.

Despite the development of some large properties since the last OS&RP, Carlisle's character is still determined by some large properties of open space that are not yet protected in any way. The goal to maintain the town's rural character can be accomplished by protecting selected vulnerable open spaces. Privately owned properties of 10 acres or more were inventoried and ranked for each of the four previous OS&RPs and again for the 2020/2021 plan. To set protection priorities, public ranking sessions were held in the spring of 2020. Ranking sessions were held online via Zoom due to the COVID-19 pandemic. As detailed in Section 2, refinement of the ranking criteria involved many stakeholders in the local conservation and recreation community, and the ranking sessions were well attended by additional members of the public. The resulting land protection values for ranking unprotected properties of 10 acres or more and the ranking method are described below and presented in Appendix A.

#### **Land Protection Criteria and Values**

These criteria are values used to rank unprotected properties in Carlisle for their desirability for protection if and when they become available. Properties are desirable if they add to the rural character of the town, preserve habitat for native animals or plants, or provide ready access to active or passive recreation.

**Agricultural Land (Prime or Active)** – The land possesses fertile or arable soil suitable for agriculture, including growing crops or other plants or grazing animals, whether or not it is currently in agriculture.

**Active Recreation** – The land is suitable for playing fields, recreational activities (such as sledding, swimming, and ice skating), recreational facilities, or garden plots.

**Core Habitat** – The land provides habitat for rare, vulnerable, or uncommon native species. Relevant areas were identified from the MassWildlife Natural Heritage & Endangered Species Program (NHESP) *BioMap2* and the 2011 CAPS (Conservation Assessment and Prioritization System) IEI (Index of Ecological Integrity) map for the Town of Carlisle, MA (maps at the end of Appendix C).

**Diversity of Habitat** – The land contains an unusual terrain, a terrain underrepresented in town, or a variety of terrains and thus provides for a variety of habitats, which, in turn, may support a variety of native animals or plants.

**Level of Development** – The land is currently undeveloped, minimally developed, easily returned to an undeveloped state, or could be subdivided to create a significant relatively undeveloped parcel.

**Linking Location** – The land abuts a property that is already protected (existing link), abuts a significant property that is undeveloped and unprotected (potential link), or provides access to another property of conservation interest. Both existing and potential links increase the usefulness of the entire tract (linking property plus abutting property) both for recreation and for native plant and animal habitat.

**Rural Vista** – The land provides a view of open fields, woodlands, or water visible from any road. Visibility from a major road is more important than visibility from a neighborhood road.

**Size** – Larger properties are more valuable than smaller properties for values such as plant and animal habitat, protection of water resources, and active or passive recreation. Abutting parcels under the same ownership are treated as one property.

Properties greater than or equal to 30 acres were scored 4;  
properties greater than or equal to 20 acres but less than 30 acres were scored 3;  
properties greater than or equal to 10 acres but less than 20 acres were scored 2;  
properties less than 10 acres (but which rounded up to 10 acres) were scored 1.

**Special Feature** – The land contains an unusual feature, such as a special habitat, a scenic spot, an exceptional woodland, or a site with archaeological, geological, historical, or other interest.

**Trails** – The land contains cart paths, trails, potential links to existing trails, or areas where new trails can be created for passive recreation to help improve the Carlisle Trail System.

**Water Resources** – The land includes areas significant for protection of water resources. The land contains or is adjacent to surface water (Concord River, streams, ponds), wetlands, vernal pools, or potential sites for town wells, protective zones around town wells, or recreational use.

## **Ranking Method**

All private undeveloped properties of 10 acres or more in Carlisle were identified. Each property was evaluated and scored in the public ranking sessions. Each property was scored 0 through 4 for each of the 11 criteria above.

## **B. Public and Non-profit Properties**

This section provides a descriptive inventory of public conservation and recreation resources (including federal, state, and municipal lands), non-profit conservation lands, and public unprotected lands. These properties are shown on Map 7: Inventory of Open Space.

Non-profit conservation lands include properties of local land trusts and similar private non-profit conservation organizations. These properties are described according to features, usage, and potential.

Municipally owned land is classified according to ownership, management agency, current use, condition, recreation potential, public access, type of public grant accepted, zoning, and degree of protection. The information is presented in Table 10: Town-owned Conservation and Recreation Properties and Facilities in Carlisle. Carlisle has a few Town-owned parcels that are not protected but does not have unprotected open space for public institutions such as hospital or prison grounds or state or federal institutions.

### **Public Recreation and Conservation Resources**

#### **Recreation Facilities Inventory**

**Town-owned Playing Fields**, except the Banta-Davis fields, are on school property, and all are in residential zones. All Town-owned recreational areas are listed here. For locations, ownership, management, facilities, and features, see Table 10.

#### **BANTA-DAVIS LAND**

Construction of three dedicated fields—one soccer, one Little League, and one softball—was completed in spring 2001. The Little League field was rehabilitated in 2017 with Community Preservation Act (CPA) funds. The land has the Rory Bentley Exercise course, a running track around the soccer field, and a beach volleyball court. An additional play structure salvaged from the school building project was installed adjacent to the soccer field in 2012. The complex has sufficient parking needed for more than 100 vehicles during peak season. Irrigation for this complex is drawn from a well on this property.

In late October, 2020, the Select Board supported the Recreation Commission’s request to apply for a grant for a dog park from the Stanton Foundation, a private philanthropic non-profit that supports canine welfare (among other areas of interest), including the creation of dog parks in Massachusetts communities. The proposed fenced dog park would be adjacent to the softball field and the volleyball court. Aside from providing a safe, structured area for dogs (especially those that may not do well on the trail system), it is hoped that the dog park will help alleviate problems with dog waste on the soccer field.

While centrally located (and walking distance from the school), there is sufficient buffer between the active play areas and neighboring residences to minimize noise and privacy conflicts. Future

expansion, including tennis courts and a multi-purpose (lacrosse and soccer) field would be possible with limited impact on abutters. The Recreation Commission believes Banta-Davis is the only site in Carlisle where organized active recreation can operate without conflict with other town interests. This land is controlled by the Carlisle Public Schools and may be designated for town projects other than recreation with approval of the Carlisle School Committee, Select Board, and Town Meeting.

#### **BENFIELD LAND**

In spring 2004, additional land with room for a single playing field was acquired for active recreation at the Benfield Parcel A site using CPA funds. This parcel is the only land in Carlisle specifically dedicated to active recreation. Subsequent to the acquisition, however, environmental concerns, the need for a lengthy access road through bordering vegetated wetlands including a certified vernal pool, and neighborhood opposition imposed significant obstacles to development of a playing field at this location. Accordingly, there are no immediate plans for a playing field at this site. This parcel is protected by CR #58 held by the Carlisle Recreation Trust.

#### **COREY GYM**

This large gym with an exercise room was built during the school expansion project in the late 1980s. The gym and exercise room are wheelchair accessible. In addition to school-run recreation activities, the Recreation Commission uses the Corey Gym for many before-school and after-school programs for all ages. Once per month, the Carlisle Youth Commission (CYC) operates the Friday Night Live (FNL) program for middle school students in the Corey Gym and exercise room. The gym has been used as an emergency shelter during widespread power outages in town, for people to sit in heated space or to charge their mobile devices.

#### **DIMENT PARK**

Diment Park, named for a long-time member of the Recreation Commission, was created in 1983. In 1999, a group of volunteers called the Carlisle Parents Connection (CPC) raised \$27,000 in private funds towards the transformation of the park into a playground for toddlers younger than two (now for age 5 and under). An additional \$10,000 was sought from Town Meeting, and, though not supported by the Finance Committee, the Warrant article was heartily supported by citizens in attendance. In 2000, the town voted to accept the toddler playground as an asset, and the Recreation Commission accepted responsibility for its maintenance. The Carlisle Parents Connection (CPC) changed its name to the Carlisle Family Connection (CFC) to avoid confusion with another town board with the same acronym. The CFC continues to assist with maintenance. Some minor structural repair was undertaken during the summer of 2013, and an Eagle Scout, Tanner Buckelew, led a clean-up effort as part of his Eagle Scout project in the spring of 2019. The gazebo roof and stairs were repaired. Due to its location on sloped land, the park is not handicapped accessible.

#### **RECESS AND PLAY AREAS**

The school building project, completed in 2012, includes a new plaza, which is a cement-topped play area with basketball hoops and a kickball area. In addition, a pre-K playground was constructed outside the pre-K classroom, and a new structure for grades K-2 was built between the new plaza and the existing Carlisle Castle playground. A play structure was removed and was re-installed on the Banta-Davis Land. There is ample parking adjacent to the play areas. Ramps provide wheelchair access to the plaza.

### **THE CARLISLE CASTLE**

The Carlisle Castle is a wooden climbing structure, constructed in 1988 by volunteers, and, with some repairs over the years, continues to be used during school recess and when school is not in session.

### **SPALDING FIELD**

Spalding Field is a 5-acre parcel that has baseball and softball diamonds in three corners overlaid by two soccer fields in the center. An underground sprinkler system has been added, and the field is in fairly good condition.

In the spring of 2019, the Recreation Commission requested and was granted funding at Town Meeting for a study of Spalding Field to determine future potential uses. The study, expected to be initiated in 2021, will examine native soil characteristics and potential soil amendments, drainage and irrigation requirements, and the type of turf installation that best suits the the field's expected use for both team sports and school classes and programs. The study will provide a fully engineered design for a drainage system, advise on the feasibility of artificial turf, and recommend the best configuration for renovation. The study will also explore constraints for future use including evaluating a slope that dictates cut-and-fill efforts, a shelf of bedrock adversely affecting the grade, subsurface materials that may contribute to sink holes, trees and branches that may need removal, and permitting issues related to the field's proximity to protected wetlands.

The adjacent parking area contains a curb cut for field access and one handicapped parking space. Like the Banta-Davis Land, this land is controlled by the Carlisle Public Schools and may be designated for town projects other than recreation with approval of the Carlisle School Committee, Select Board, and Town Meeting.

### **TENNIS COURTS**

At Annual Town Meeting in 2003, the citizens voted to appropriate \$75,000 for the construction of four new tennis courts on the Banta-Davis land. This project was never initiated due to higher than expected construction bids, and the appropriation expired. The Recreation Commission added four pickleball courts to the tennis courts by painting pickleball court lines in the summer 2020. Pickleball nets are kept in a storage container at the courts and available for use by residents.

### **TOWN HALL**

The Recreation Commission has an office in the Town Hall and offers exercise and fine art classes in the building for all ages.

### **SKATING RINK**

A seasonal outdoor skating rink at the parking lot at Kimball's ice cream stand has been installed in winter for the past 15 years. Citing problems with maintenance and frequent damage to the rink, the Recreation Commission has decided to discontinue efforts related to the artificial rink. It has initiated discussions with the Conservation Commission regarding possible siting of a skating area on a local pond, expressing a preference for the Cranberry Bog over Greenough (access issues) and GBFSP (permitting issues).

## **Accessibility**

All lands used for recreation that are not under school management, in addition to Conservation lands, were inventoried for accessibility (Table 11 and Appendix F).

## **Conservation Land Inventory**

Carlisle has approximately 3,488 acres of protected natural space as of October 2020, an increase of 126 acres since the 2013 OS&RP. Protected open space comprises approximately 35% of Carlisle's total acreage of 9,913 acres and includes conservation lands owned by the Town (1,142 acres) protected under Article 97 of the Massachusetts constitution, land owned by the Commonwealth (998 acres), federal land (321 acres), land privately owned by CCF (220 acres), land owned by Harvard University and protected by a recorded "Statement Of Public Charitable Obligation" (95 acres), land owned by Sudbury Valley Trustees (8.98 acres), additional land protected by permanent CRs (701 acres), and land restricted by a landowners' association (2 acres). Lands such as the Davis Corridor (126 acres) and the Estabrook Woods Buffer Lands (68 acres), which are Town-owned conservation lands also protected by permanent CRs, are counted only once in the final total acreage of protected land. Similarly, lands such as Poole's Swamp (15.2 acres) that are CCF-owned conservation lands that are also protected by CRs are counted only once. (Any slight discrepancy between the acreages in this paragraph and those in the tables is due to rounding.)

The following Tables list protected land in Carlisle and land in Chapter 61, 61A, or 61B.

Table 1: Town-owned Conservation Lands (as of 31 October 2020)

Table 2: Town Acquisitions for Conservation (as of 31 October 2020)

Table 3: Commonwealth and Federal Lands in Carlisle

Table 4: Non-profit Conservation Organization Lands (as of 31 October 2020)

Table 5: Properties with Conservations Restrictions (CRs) (as of 31 October 2020)

Table 6: Lands in Chapter 61, 61A, or 61B

Table 8: Open Space Created by Cluster Developments

Table 9: Properties of the Greater Estabrook Woods in Carlisle

The Carlisle Conservation Commission has established rules and regulations for Town-owned conservation lands (Appendix B).

The Carlisle Trails Committee published a new guidebook, *Trails in Carlisle*, in 2018, with maps of trails, descriptions of public open space lands in town, and descriptions of historical markers. The trail network is shown on Map 10.

## **Town-owned Conservation Land**

Town-owned conservation lands are described below. Suggested activities, the facilities, the accessibility, and special regulations are included for the more frequented properties. Signage on Town conservation land was replaced and upgraded approximately 10 years ago using CPA funds and is currently being evaluated by the Land Stewardship Committee, which is in the process of reassessing, cleaning, fixing, and replacing signage. In addition, rules for camping were adopted by the Conservation Commission and have been helpful for scouting organizations and others. In 2010, Rules and Regulations for trail use by Other Power-Driven Mobility Devices

(OPDMDs) on Town-owned conservation land were developed and approved by the Conservation Commission in 2012 and modestly updated in 2020. From 2016 through 2019, the Select Board (SB) authorized an annual bow hunting season, managed by the Deer Control Committee, on select conservation properties and other Town-owned land in an effort to control the deer population. The SB voted to suspend deer hunting on public land for the 2020 hunting season and to put the question to a future Town Meeting as to whether or not the SB should allow hunting on Town-owned public land.

#### **BENFIELD CONSERVATION LAND**

This 25.68-acre parcel was acquired for conservation in 2004 as part of a larger 45-acre purchase for limited affordable housing, one ball field, and additional protected open space. Although not conservation land under MGL Chapter 40, Section 8C, this parcel is subject to CR #57 granted to CCF. The parcel consists of gently sloping open fields, a certified vernal pool, and wetlands associated with Spencer Brook. The wetlands connect this parcel with the Bisbee Land and CCF's Spencer Brook Reservation. The land is included in BioMap 2's Core Habitat designation. *Activities:* The fields are available for hiking, birding, kite flying, and other passive recreation activities.

*Facilities:* The Benfield Farms housing project was completed on the site in February 2014 and consists of 26 units of affordable, age-restricted rental housing. There is public access and parking available from a dedicated parking area at Benfield Farms to a trail network including a forested area and to a wildlife viewing platform over the Spencer Brook wetlands built in 2011 by CCF and the Carlisle Trails Committee. The field is periodically mowed.

*Accessibility:* Currently trail accessibility is limited and not suitable for wheelchairs. The wildlife viewing platform was built to standards of the Americans with Disabilities Act (ADA).

*Special Regulations:* The CR allows for installation of a public water supply well and for a subsurface septic system for the affordable Benfield Farms housing complex on another portion of the Benfield property. The septic field has had recurring breakout issues and is undergoing engineering review for repair or replacement. To protect the well, per Massachusetts Department of Environmental Protection (MassDEP) public water supply regulations, portions of the property are subject to restrictions on activities that would normally be allowed on conservation land such as grazing by animals, certain agricultural activities, camping, and the chemical treatment of Poison Ivy and invasive plants.

#### **BISBEE LAND**

This 34-acre parcel was purchased in 1987 for purposes of conservation and outdoor recreation. According to the original Warrant Article, the Carlisle Conservation Commission is responsible for managing the outdoor recreation on this parcel. It includes open fields, which are currently hayed by a local farmer, and trails in wooded areas.

*Activities:* Currently the area is used for walking, horseback riding, and cross-country skiing.

*Facilities:* Parking is informal, on a pull out along Concord Street.

*Accessibility:* The trails are not handicapped accessible. Parts of the field, however, can be navigated by some wheelchairs. The Bisbee Loop is accessible to certain types of OPDMDs (Appendix B).

#### **BLANCHETTE LAND**

Two parcels of land totaling 4.41 acres were transferred to the Conservation Commission in 2019 by the developer of Arrowhead Lane off Rutland Street. The land had previously been owned for many years by the Blanchette family, which ran Blanchette Gardens Nursery. The land has both upland with mature mixed forest and wetland. The land abuts a Conservation Restriction associated with Great Brook Estates and a large, private, undeveloped property abutting Great Brook Farm State Park.

*Activities:* There are no public trails.

*Accessibility:* The property is landlocked, with access currently limited to homeowners of Great Brook Estates and some residents of Arrowhead Lane and for annual monitoring by Town of Carlisle officials.

#### **BUTTRICK WOODS CONSERVATION LAND**

This 13.97-acre parcel bounds three sides of the Buttrick Woods development on Concord Street. It is part of the Estabrook Woods Buffer Lands and is subject to CR #52, which is monitored annually by The Trustees of Reservations (TTOR). It was deeded to the Town through the Conservation Commission in 2000 as part of a conservation cluster development to provide a wildlife corridor from the Bisbee Land to the nearby Estabrook Woods.

*Activities:* Currently there are no activities on the land. No trails have been established.

*Facilities:* There are no facilities.

*Accessibility:* There are no trails on this property.

#### **CARR LAND**

This 6.08-acre, land-locked parcel of upland forest abuts the Rockstrom Conservation Land. It is part of the Estabrook Woods Buffer Lands and is subject to CR #52. Trails leading from both Bellows Hill Road and the Rockstrom Land to the Estabrook Woods pass through this property.

#### **CRANBERRY BOG CONSERVATION LAND**

The 310-acre Cranberry Bog conservation area straddles the Carlisle-Chelmsford line. Access to Carlisle's 151 acres is via Curve Street. Carlisle's portion contains about 40 acres of cranberry bog in addition to the ponds, reservoirs, and adjoining wooded areas of both uplands and wetlands. The ponds, reservoirs, and wetlands are supplied by the River Meadow Brook (RMB) that originates at the protected O'Brien Farm in Westford. The RMB drains a 24-square-mile area as it meanders through Westford, Chelmsford (twice), Carlisle, and ultimately through Lowell where it is a primary tributary to the Concord River. There are four certified vernal pools within Carlisle's portion of the Bog.

Renovation and repair of the historic Cranberry Bog House was initiated in 2010 and completed in the fall of 2012 with funds from the Community Preservation Act. A local farmer grew cranberries under a long-term agreement with the Town that expired in 2016. An absence of willing farmers due to the continued downward trend in profits from cranberry crops statewide led the Conservation Commission to conclude that growing cranberries is no longer a feasible option for the land. The Town is currently evaluating other options for the Bog going forward. (See below.) In 2018, Town Meeting authorized funds for the long-term farmer to continue some of the annual maintenance of the bog area. The Cranberry Bog Conservation Land continues to be extremely popular for passive recreational use among both Carlisle residents and non-residents.

This statement is supported by two surveys, as described below.

Survey by the Cranberry Bog Alternatives Committee (CBAC) – 2016

- Visual counts of people, cars, and dogs were noted over a 17-day period in September 2016 (32 observations)
- Estimated an average of 290 visitors per day
- Average ratios: People/Cars = 1.5; People/Dogs = 1.8
- Heaviest use in afternoon and early evening

Survey by the Cranberry Bog Working Group (CBWG) – 2020

- Questionnaires were available at the Bog or online; voluntary submittal
- A total of 305 responses were received as of 17 June 2020
- 61% of respondents use the Bog daily or weekly; 51% of respondents were not Carlisle residents
- Most respondents used their visits for walking; 66% used their visits for dog walking
- Given a choice of 11 features at the Bog, the top ranked features were (1) vistas, (2) ponds, (3) dog access, and (4) wildlife

Careful water management of the River Meadow Brook (RMB) that flows through the Cranberry Bog Conservation Land and maintaining the deeded water rights for the Carlisle Cranberry Bog have long been the most challenging aspects of the Cranberry Bog Conservation Land.

Consequently, Carlisle participated, from 2013 through 2015, in the River Instream Flow Stewards (RIFLS) program run by the Massachusetts Department of Fish & Game's Division of Ecological Restoration. The purpose was to document and understand the flow characteristics of the RMB, including its response to precipitation events and to human actions that impound water in, or release water from, upstream ponds and reservoirs. The resulting data have provided a quantitative basis to evaluate existing and proposed uses of water in the RMB drainage basin (upstream of the gage, near Curve Street) and the adequacy of flows in the RMB for sustaining aquatic life. Since 2012, Carlisle and Chelmsford conservation representatives have met twice a year to share and discuss information concerning their respective portions of the Cranberry Bog Conservation Lands, especially concerning water management, water impacts, and the current and potential uses of this natural resource.

In 1999 and 2011, the Chelmsford Water District (CWD), a private for-profit company, proposed the development of the Barnes Terrace Wellfield on land in Chelmsford that abuts the Chelmsford portion of the Cranberry Bog. The CWD proposed a groundwater withdrawal rate of 360,000 gallons per day from surficial aquifer wells. This area is in close proximity to the Carlisle Cranberry Bog Conservation Land, and the proposed withdrawal rate could have had a significant ecological impact on the Cranberry Bog as well as the hydrologically downgradient basin. Water pumped from this area would have eventually entered the Chelmsford sewage treatment system, resulting in an interbasin transfer of water from the Concord River basin to the Merrimack River basin. Carlisle objected to these two proposals, citing the registered water rights awarded to Carlisle under the Massachusetts' 1986 Water Management Act based on the cranberry agriculture and the deeded water rights that extend into Chelmsford up to and including Heart Pond. The CWD ultimately withdrew the proposed wellfield developments.

In late 2019, given the discontinuation of cranberry agriculture in Carlisle, the CWD again proposed installing a surficial aquifer well at the Barnes Terrace property. The CWD notified Carlisle of this proposal to which the Carlisle Select Board and the Carlisle Conservation Commission filed a legal objection. Warren Lyman, a member of Carlisle's Land Stewardship Committee, did an extensive analysis of the statutory requirements involved with well installation proposals, previously submitted environmental studies by CWD, and a technical analysis of the environmental impact to the RMB water flow using the RIFLS data. His research revealed that (1) for the 2019 CWD proposal, the Massachusetts Environmental Policy Act (MEPA) requirements would probably not be met with a 20-year old Environmental Notice Form (ENF) but would likely require the re-submission of a more recent ENF along with other updated pertinent documentation, and (2) the Massachusetts Interbasin Transfer Act might be invoked in this instance because the proposed CWD withdrawal rate of 4.8% of annual precipitation exceeds the allowable withdrawal rate of 1% of annual precipitation for the drainage area based on the flow data collected from the RIFLS study. The disappointing result from the CWD current pump tests, the State's significant restriction of allowable withdrawal, and the potential of other options, combined with the CWD's cost-benefit analysis of development costs, caused the CWD to close out the Barnes Terrace Wellfield Project. For the immediate future, this issue seems settled.

At this time (September 2020), the future of the 40 acres of the Bog that were used to grow cranberries is not yet known, but after much research and deliberation, a preferred alternative is beginning to come into focus. Initially, the Cranberry Bog Alternatives Committee (2016-2018), a subcommittee of the Conservation Commission, evaluated, described, and ranked 12 Alternatives for the Conservation Commission to consider. The Committee's findings were described in two reports, the main one dated April 2017 and an Addendum dated April 2018. Following a Conservation Commission initiated peer review of the reports in 2018, the Commission formed a new subcommittee, the Cranberry Bog Working Group (made up mostly of Conservation Commissioners) to evaluate the Alternatives. The Committee's most favored Alternative at present is one that would maintain the 40 acres of bog as a wildlife habitat in a manner that does not require any engineered restoration and that would preserve the vistas and ponds. It is anticipated that this could be done for the Bog with a State-approved management plan and approval under the Massachusetts Wetlands Protection Act that would allow necessary maintenance activities. At the 2020 Special Town Meeting in October, \$5000 in funding was approved to engage a qualified wetland scientist to develop a plan for low-cost long-term maintenance of the Bog.

*Activities:* Self-guided trails with interpretive signs circle the cranberry bogs and connect to trails that wind through the wooded uplands. The ponds provide fishing, canoeing, and ice skating. The land is used for hiking, biking, dog walking, snow-shoeing, cross-country skiing, and horseback riding. The varied habitats invite birding and other natural history studies.

*Facilities:* Parking is along the street. There is a small lot for a few cars next to the Bog House.

*Accessibility:* The interpretive signs and parts of the dike trails are wheelchair accessible. Several trails are accessible by certain types of Other Power-Driven Mobility Devices (OPDMDs) (Appendix B).

*Special Regulations:* Dogs and people must stay on the trails. Dispensers for dog-waste bags are located at the Bog House and near the parking area on Curve Street, and signs encouraging

dog-waste removal and suggestions for considerate behavior on the part of dog walkers have led to more compliance.

Connections: Carlisle's Cranberry Bog trails connect with trails in the Chelmsford-owned Cranberry Bog Reservation, and, via a trail through the 18-acre portion of the land southeast of Curve Street, with trails in Great Brook Farm State Park (GBFSP).

#### **DAVIS CORRIDOR**

This 126.4-acre wooded property is accessed from Bedford Road and continues southward off Stearns Street, into Harvard's Estabrook Woods to the Concord town line. Between 1974 and 1979, the Town of Carlisle, with the assistance provided by the State Self-Help Program, purchased the properties that compose this north-south corridor, which has trails connecting through Estabrook Woods to miles of trail in Concord. The Davis Corridor is subject to CR #36, which is monitored annually by TTOR. There is also a small, wild cranberry bog along Two-Rod Road, an historic carriage trail that connected Carlisle to Concord during the Colonial period.

Activities: The land is used for hiking, cross-country skiing, mountain biking, running, horseback riding, and birding.

Facilities: Access on Bedford Road is marked with a sign. Although there is currently no parking by the Bedford Road entrance, there is parking for 2 cars at each of the entrances to the property located at the end of Long Ridge Road and at the end of Nowell Farme Road. The Davis Corridor also abuts the Malcolm Conservation Land and its nine-car parking lot, which is plowed during winter and provides ample parking for those entering the Davis Corridor and Estabrook Woods via the Two Rod Road trail.

Accessibility: The trail is not recommended for wheelchairs, due to rough terrain and wet conditions most of the year. Several trails are accessible by some OPDMDs (Appendix B).

#### **DEACON LAND**

This 7.51-acre property consisting of wetland and some upland forest abuts the Sachs Greenway and the Rockstrom Conservation Land but lacks a dry trail connecting the two. It is part of the Estabrook Woods Buffer Lands and is subject to CR #52. Invasive plants are becoming increasingly established within the wetlands on the property.

#### **FISK MEADOW**

This 11.6-acre parcel off Lowell Street across from the Transfer Station is approximately two-thirds wetland and one-third open agricultural field, under a farming agreement with a local farmer. It has no trails but serves as a wildlife corridor from Old Morse Road (path) and Conant Land through the Department of Public Works (DPW) area to Great Brook Farm State Park (GBFSP). It functions as part of the Historic District's backdrop and as plant and wildlife habitat. It adjoins a 3-acre open field along Lowell Street that is protected by CR #13.

#### **FOSS FARM**

This 55.7-acre parcel off Bedford Road was purchased in 1971 for conservation and recreational use with monies from the town's Conservation Fund, the state's Self-Help Fund, and the Federal Land and Water Conservation Fund. The property is bordered by Great Meadows National Wildlife Refuge (GMNWR) and the Concord River to the south and east. A popular trail leads from Foss Farm across the Refuge and connects to the Greenough Conservation Land.

Activities: Approximately 20 acres of field are currently dedicated as agricultural land and are

cultivated by a local farmer under an agricultural license agreement with the Conservation Commission. Woods and trails provide for walking and horseback riding. Approximately 100 community garden plots are available on a first come, first served basis. All the garden plots are accessible by automobile via the farmer's road from the Foss Farm parking lot on Bedford Road. The edges of the fields, roads, community gardens, and trails are periodically cleared of debris and plants, including invasive species such as Glossy Buckthorn, as part of the Foss Farm maintenance program. The horse and pony riding rings accommodate both dressage and jumping. Woodland roads and the farmer's road around the agricultural fields have historically been used for training sled dogs. Other activities include jogging, hiking, limited trail biking, model airplane flying, model rocket launching, cross-country skiing, snow shoeing, and birding. American Woodcocks, Indigo Buntings, Eastern Bluebirds, Killdeer, and owls are in residence, and several bluebird houses have been erected and maintained for many years. In the non-growing season and after the soil is turned over in preparation for the next year's crops, people with a land use permit may look for buried items using metal detectors in the cornfields, donating discovered items of historical value to the Historical Society. Group activities are allowed by permit from the Conservation Commission. Bryan Windmiller, Director of Conservation at Zoo New England, planted herbaceous state-listed plant species New England Blazing Star plants at Foss Farm beginning in 2019. In September 2020, Orange Milkweed (Butterfly Weed) was added to the planting area because it had also been found growing on the property. The property has also been used to support scientific undertakings, such as biosurveillance training for invasive Emerald Ash Borer beetles.

Facilities: Garden plots are plowed in the spring by a volunteer (the property's licensed farmer), and hand pumps provide the water supply. During the past several years, installation of 10 water supply wells was completed using the fees from gardeners. The community garden rules were revised in 2010 to provide a more structured application process and wait list and are reviewed annually. The gardens are managed by a volunteer. The parking lot is large in order to allow for multiple horse trailers.

Accessibility: Handicapped parking is provided. The land is flat to gently sloping. The dirt road to the community gardens and some of the other trails are marginally wheelchair accessible.

Existing soils are very sandy and access might be improved by surfacing some of the paths with crushed stone dust. Some of the trails are accessible by certain types of OPDMDs (Appendix B).

Special Regulations: Permits are required for certain activities, such as gardening, dog training, after-sunset activities, and horse activities. The 2018 map from the NHESP shows an Estimated Habitat of Rare Wildlife polygon for Blue-spotted Salamander. Foss Farm is included in BioMap 2's Core Habitat designation. There is a documented Native American site on the property as designated by the Massachusetts Historical Commission.

#### **FOX HILL**

This 11.22-acre area of open fields, field edge, and forest on the corner of Bedford Road and Stearns Street provides a rural vista to travelers on Bedford Road.

Activities: A local farmer maintains hay fields in the eastern and western fields. The open areas are available for walking dogs, birding, and horseback riding. A path is periodically mowed across the fields and around the field edges.

Facilities: Parking is along the street.

Accessibility: The field is generally accessible from Stearns Street and can be traversed by wheelchair or stroller when the hay is not too high. However, erosion is a problem at the entrance.

The addition of a small amount of crushed stone dust at the entranceway would improve accessibility. The Fox Hill path is accessible to certain types of OPDMDs.

Special Regulations: There are no special regulations. The Board of Health maintains a water monitoring well on this property near Bedford Road.

#### **GAGE WOODLAND**

This landlocked 14-acre parcel with an access easement over private land is located off Ember Lane and abuts GBFSP. It was a gift by will to the Town of Carlisle in 1936. The 1994 Annual Town Meeting voted that the property be managed by the Carlisle Conservation Commission. The property is an upland hardwood forest without mapped trails. A trail west of Lowell Street provides public trail access from the State Park to the Gage Woodland.

#### **GREAT BROOK ESTATES OPEN SPACE PARCEL 1**

This 3.67-acre parcel is associated with a conservation cluster development and was acquired by the Town in 2000. It is encumbered by a locally approved CR granted to the Town of Carlisle. A trail on the property provides access from Rutland Street to GBFSP.

#### **GREENOUGH LAND**

This 255-acre property was purchased in 1973 with state and federal assistance. It abuts 8 adjoining acres located in Billerica owned by CCF. The land features large rock outcroppings, a 20-acre pond, streams, wet meadows, agricultural fields, a planted Red Pine grove, and 1,800 feet of frontage along the Concord River. There are four certified vernal pools. A trail across GMNWR connects the Greenough Land to Foss Farm. A large slate-roofed barn near the Billerica border is going to be removed. An earthen dam crosses Pages Brook, creating Greenough Pond and providing a critical trail link between the northerly section of Greenough Conservation Land and the Town of Billerica to trails to the GMNWR. Pages Brook flows to the Concord River. The dam, classified Low Hazard by the Massachusetts Office of Dam Safety, needs repair, and the Town is seeking funding assistance to be able to undertake the fully permitted project. Most of Greenough Land is included in BioMap 2's Core Habitat designation, and the property is mapped by NHESP as Priority and Estimated Habitat for two state-listed Threatened species.

Activities: A popular trail network exists with a link to GMNWR and Foss Farm. The pond is used for fishing, wildlife viewing, canoeing, and kayaking. The varied habitats are exceptional for bird and dragonfly watching. Mr. Greenough installed wood duck boxes in the pond in 1949. The Massachusetts Department of Fish and Wildlife took over the care of the boxes and added boxes in the associated wetland on Maple Street in 1979 as part of a Wood Duck and Hooded Merganser study. Forty-nine years of data from this study has been made available to the Conservation Commission. In winter, the trails are used for cross-country skiing, and the pond is available for skating and ice fishing.

Facilities: There are two off-street parking lots for a total of 18 cars on Maple Street.

Accessibility: Numerous tree roots in the paths make wheelchair travel difficult beyond the parking lot on Maple Street. The Wood Duck Trail is accessible to certain types of OPDMDs (Appendix B). The driveway through CCF-owned land to the Greenough barn from Billerica is available only to emergency vehicles and is now gated for security reasons. Limited informal parking is available at the end of River Edge Road in Billerica.

#### **GREYSTONE CROSSING CONSERVATION LAND**

This 14.33-acre series of parcels abutting the Greystone Crossing development is the portion of the developed parcel required to be set aside for open space by the Planning Board as a condition of the conservation cluster special permit. The parcels were acquired by the Town for conservation purposes in 2006. There is a certified vernal pool on the property. The Greystone Trail from the end of Captain Wilson Lane to Bingham Road was created as an Eagle Scout project and passes some of the large rock outcroppings on the property.

Accessibility: An accessible paved pathway installed by the developer meanders the length of the development through the woods along Cross Street and past the vernal pool.

#### **HART FARM CONSERVATION LAND**

This 13.5-acre parcel off Curve Street was deeded to the Town as part of a conservation cluster development. This parcel is contiguous with the Cranberry Bog Conservation Land. With the adjacent Hart Land, an additional 65-acre parcel of municipal land that is predominately wetlands, it is reserved as a potential future municipal water supply. The land is level, wooded, quite low, and bordering an extensive wetland. There is a certified vernal pool on the property.

Activities: There is a connecting trail from the end of Hart Farm Road to Old Morse Road and another from the end of Daniels Lane to the Otter Slide Trail. These trails create a walking loop and link to GBFSP, the Cranberry Bog Conservation Land, and ultimately to the pedestrian pathway on Lowell Street and the Conant Land.

Facilities: There is off-road parking for two cars at a small lot off the Hart Farm Road cul de sac.

Accessibility: The trail is rough and not suitable for wheelchairs.

#### **HARTWELL WOODS**

This 6.95-acre property consists of 2 parcels, a 4.98-acre parcel of Town-owned land and an abutting 1.97-acre donated parcel that was transferred to the Carlisle Conservation Commission for management by 2018 Annual Town Meeting. This transfer was part of a coordinated effort with the Concord Land Conservation Trust, which was negotiating with the owner of an abutting open field. The Carlisle land is forested wetland and floodland and abuts the Bisbee Conservation Land. The small donated parcel is located between this lot and Hartwell Road.

Activities: There are no established trails in the Carlisle portion.

#### **HEIDKE PARCEL**

This 8.19-acre parcel off Brook Street is almost entirely wetland. The land provides a valuable wildlife corridor between the Town Forest and the Greenough Land.

#### **HUTCHINS AND ROBBINS FIELDS**

This property consists of 34.45 acres of fields and woodland purchased by the Town in 1999 with assistance from the Massachusetts Agriculture Preservation Program, so the property is under an Agricultural Preservation Restriction (APR).

Activities: The fields are in active agriculture and are managed by a local farmer. Although there is no maintained trail, people enjoy walking their dogs and birding along the perimeter of the fields during the growing season. In the non-growing season and after the soil is turned over in preparation for the next year's crops, people with a land use permit may look for buried items using metal detectors, donating discovered items of historical value to the Historical Society.

Special Regulations: Agricultural activities during the growing season allow public access only to the field edges.

#### **ICE POND CONSERVATION LAND**

This 7.05-acre parcel is mostly wetland, was acquired by the Town in 1997 for conservation purposes, and is protected by CR #28.

#### **KEYSTONE LINK**

This landlocked, approximately 1-acre parcel located off South Street was transferred to the care of the Conservation Commission from the Town in 2009. A trail was built through the lot in 2011, providing a link from West Street to the CCF-owned Benfield Hill property.

#### **MACAFEE LAND**

This 15-acre parcel was given to the Town in 1992. It contains large areas of wetlands. The land lies along Carlisle's border with Westford, and trails lead toward Westford and nearby Chelmsford. The parcel also serves as a conservation buffer for the nearby historic, state-owned Carlisle Pines section of GBFSP. A trail links the two natural spaces. An easement was negotiated over abutting private land in Westford to allow access to the Bruce Freeman Rail Trail via Sleigh Road.

#### **MACONE PROPERTY**

This 3-acre parcel was given to the Town in 1992. The property is land-locked and is located off Bedford Road and Brook Streets. It is almost entirely wet year round. There is an easement for a trail leading from Bedford Road that has not been developed, so it is currently inaccessible.

#### **MALCOLM LAND**

This 22.9-acre property off Stearns Street was purchased in 1996 and received Commonwealth Self-Help reimbursement. It abuts both the Town-owned Davis Corridor and the CCF and TTOR jointly owned 10.6-acre Malcolm Preserve. This upland property includes secondary succession woodlands. There are bluebird houses located on the property. The Malcolm Land is part of the Estabrook Woods Buffer Lands and is subject to CR #52, whereas the Malcolm Preserve is subject to CR #53.

*Activities:* A trail (historic Two Rod Road) runs from Stearns Street to the Estabrook Woods. The property invites hiking, birding, and cross-country skiing.

*Facilities:* There is an off-street parking lot with nine spaces. Access to this parking area is through the driveway for Malcolm Meadows, a senior housing development on Stearns Street.

*Accessibility:* The handicapped-accessible stone-dust trail on the adjacent Malcolm Preserve invites wheelchair users to enjoy the woods and fields. There is handicap-accessible parking immediately next to the trail.

#### **MANNIS LAND**

This 28-acre property is an aggregation of wet and wooded parcels off Aldershot Lane, Rutland Street, and North Road. It serves as wildlife habitat and a buffer between developments. There is one certified vernal pool. Trails created in 2012 link with a trail installed on the Rangeway Conservation Land. This land abuts the historic Rangeway Road.

#### **RANGEWAY CONSERVATION LAND**

This 8.15-acre open space parcel abutting the Chestnut Estates development is the portion of the developed parcel required to be set aside for open space by the Planning Board as a condition of

the conservation cluster special permit. It was deeded to the Town for conservation purposes in 2007. There is a certified vernal pool on the property. A trail was installed in 2011 by Boy Scouts as an Eagle Scout project. Two boardwalks were constructed in the fall of 2015 by community volunteers with CPA funding for materials.

#### **ROCKSTROM CONSERVATION LAND**

This 7.55-acre parcel was deeded to the Town in 1998 as part of a conservation cluster development. The wooded parcel contains an important trail that runs from School Street to trails on the Carr Land, the Woodridge Road neighborhood through CCF's Poole's Swamp land, and the Estabrook Woods. The Rockstrom Conservation Land is subject to CR #52, known as the Estabrook Woods Buffer Lands, granted to TTOR.

Activities: The trails are used year-round. The natural space offers trail hiking, cross-country skiing, and birding.

Accessibility: The trails are not handicapped accessible due to terrain, tree roots, and rocks.

#### **RUSSELL CONSERVATION LAND**

This 21.99-acre parcel was deeded to the Conservation Commission as part of the Garrison Place Senior Residential Open Space Community in 2018. The property contains sections of Spencer Brook and its associated wetlands, open fields, and a large mature pine forest. To the east is CR #50, which is currently home of the Clark Farm CSA (Community Supported Agriculture). There is a trail system on the Russell Conservation Land, an approved plan for a boardwalk over a small tributary stream to Spencer Brook, and an access stairway off Russell Street to provide legal public access for foot traffic to the trail. In 2020, the trail provided a view of a heron rookery. The property has a problem area with invasive Japanese Knotweed and Multiflora Rose. The area appears to be excellent turtle habitat with signs posted by abutters along Russell Street to caution drivers. A section of the property abuts a private home and is being mowed as lawn to control invasive plants until a management plan is developed, approved, and implemented.

Activities: Hiking trails can be used year-round. Some agriculture is allowed.

Accessibility: No off-road parking is available.

Special Regulations: Some limits on use are required due to a public water supply well located within the forested area. Much of the land is within a 200-foot protected riverfront resource area.

#### **SACHS GREENWAY**

This 9.34-acre property, which was purchased in 1997, includes two parcels. One parcel is a narrow strip abutting Harvard's Estabrook Woods and features a trail connecting the south end of Baldwin Road to the Two Rod Road trail. The second parcel is Two Rod Road itself. Sachs Greenway is part of the Estabrook Woods Buffer Lands and is subject to CR #52.

Activities: The hiking trails are used year-round. Activities include cross-country skiing and bird watching.

Accessibility: The trails are not handicapped accessible.

Special Regulations: Trail bikes and horses are not allowed.

#### **SWANSON FAMILY LAND**

This 3-acre lot with frontage on Barnes Place within the Tall Pines subdivision abuts Carlisle Pines and was given to the Town for conservation in 1998. The Trails Committee established a trail through this lot to link with the trail network in the Carlisle Pines section of GBFSP.

A portion of this lot serves as a small retention basin that provides part of stormwater management for the Tall Pines subdivision.

Accessibility: Limited parking is available on a turn out on Barnes Place. The marked trail is not suitable for wheelchairs.

#### **SWANSON LAND**

This 20-acre parcel abuts Robbins Field. The accessible portion is a mature white pine forest, surrounded by an extensive wetland.

Activities: The open pine forest is available for hiking and picnicking.

Accessibility: Parking is available at the end of Hart Farm Road. A rugged trail leads from the field's south edge. The trail is not suitable for wheelchairs.

#### **TOWLE LAND**

This 121-acre property, the greater part of which was purchased in 1968 with state and federal assistance, features rolling fields along Westford Street, and the surrounding woods contain hills with rock outcrops, small streams, and wetlands. There is a small pond held in place by an earthen dam near the parking area providing trail access to the fields. Formerly a cow pasture, the land includes a cow tunnel under Westford Street, built in 1914, that allowed cattle to reach pastures on the other side of the road. Piles of stones possibly made by Native Americans include effigies and stones aligned with astronomical events such as sunrise on the winter solstice. Most of the Towle Land is included in BioMap 2's Core Habitat designation. There are eight certified vernal pools.

Activities: Wooded trails and open fields invite hiking and birding. The trails and fields are available for cross-country skiing in winter. Bluebird boxes are placed around the field.

Facilities: A parking lot off Westford Street accommodates 12 cars.

Accessibility: The terrain is hilly in the forested areas and not readily traversed by wheelchair. The trail in the field may be accessible to certain types of OPDMDs (Appendix B).

#### **TOWN FOREST**

Established by the Town in 1925, the 71-acre Town Forest on East Street has been treated by the Town, and specifically managed by the Conservation Commission since a vote of Town Meeting in 1994, as a single, undivided, protected open space parcel. The parcel features hilly hardwood forestlands, mature Red Pine and Eastern White Pine plantations, and wetlands. The Town Forest is also included in BioMap 2's Core Habitat designation. It is included in the NHESP Priority and Estimated Habitat map for 2008. There are three certified vernal pools. During the fall of 2012, this property suffered severe tree loss from Hurricane Sandy. The Town Forest, together with the Heidke Land and Greenough Land, forms a 334-acre contiguous conservation area.

Activities: A trail network within the forest invites hiking, cross-country skiing, bird watching, and nature study.

Facilities: There is no parking lot at the Town Forest. Visitors must park on the street.

Accessibility: Although some of the trails are old woods roads, the terrain is hilly, rough, and not suitable for wheelchairs. Several trails are accessible to OPDMDs (Appendix B).

#### **WOODWARD CONSERVATION LAND**

This 6.05-acre property located on Maple Street consists of two previously developable lots measuring 4.01 and 2.04 acres respectively that were acquired for conservation purposes by the

Town pursuant to an October 2017 Special Town Meeting. The property consists of an open meadow, with some bordering wetland and forest. It has been in active agriculture for many years and is currently under license to a farmer with goats. The property is protected by CR #68.

Activities: Public trails around the fields and connecting to trails at GMNWR are planned. Terms of the CR allow for future road-safety work along Maple Street.

Facilities: There are no public parking facilities.

### **Commonwealth-owned Conservation Land**

#### **GREAT BROOK FARM STATE PARK (GBFSP)**

This 998-acre area features a Visitor Center, a working dairy farm with a state-of-the-art barn and robotic milking facility, an ice cream stand, an extensive trail network through fields and woods, small ponds, a canoe launch, streams, a cross-country skiing venue, and trail linkages to many of Carlisle's other open spaces. As noted in Section 7, the New England Mountain Bike Association sponsors periodic Trail Maintenance Days in the State Park. Volunteer crews from the Student Conservation Association (SCA), funded by the National Park Service and private donations, have also assisted with trail maintenance. There is a \$3.00 parking fee for visitors to the Park.

#### **CARLISLE PINES STATE FOREST**

Carlisle Pines State Forest is a 22.9-acre isolated parcel of GBFSP (about 2 miles away from the main park acreage) that protects a small stand of virgin Eastern White Pine and Eastern Hemlock trees exceptional for their size and grandeur. The Carlisle Pines State Forest parcel is completely wooded with deciduous and coniferous trees, with some planted Red Pines. Old cart paths provide access through the woods. Parking and access is available at the ends of Barnes Place and Forest Park Drive.

### **Federally Owned Protected Land**

#### **GREAT MEADOWS NATIONAL WILDLIFE REFUGE**

This 321-acre area bordering the Concord River protects much of Carlisle's riverfront on this Wild and Scenic River. The refuge can be traversed by trails that link the Greenough Land and Foss Farm conservation lands. Archery hunting of deer and waterfowl are allowed in some parts of the refuge with a refuge hunt permit. The Town holds an easement to a Water Rights Area within GMNWR for a potential public water supply well field with an easement to provide access to Maple Street.

Activities: The hiking trails are open year-round, with encouraged activities including wildlife observation (especially birdwatching), photography, snowshoeing, and cross-country skiing.

Facilities: There are no facilities and no public access to barns and other buildings.

Accessibility: The trails are not handicapped accessible in the Carlisle portion of the refuge.

Special Regulations: Dogs, bikes, off-road recreational vehicles, and horses are not allowed on trails. Building fires and swimming are prohibited. No access is allowed off the trails. Fishing is allowed in the Concord River, and hunting is allowed during hunting season.

### **Privately-owned Protected Land**

Select privately owned protected lands of interest are described below. See Table 4 for privately owned CCF and SVT lands and Table 5 for private lands protected by CRs.

**BATES FARM LOT**

This 6-acre parcel located along Bedford Road opposite Green Cemetery is owned by Carlisle Land Trust, a legal entity of CCF and is protected by CR #38. The meadow contributes to the open vista along Bedford Road and is maintained as pasturage by abutters. A paved town pathway along its perimeter on Bedford Road provides public access. Survey activities and marking to resolve boundary questions were completed in 2011.

**BEN'S WOODS** *(formerly known as BENFIELD C AND D)*

This 48.7-acre CCF property of two adjoining parcels is located on West Street and Pope Road. A publicly accessible trail traverses the property from West Street near Applegrove Lane to the junction of Pope Road and West Street, connecting with the Spencer Brook Reservation across the road. The Carlisle Conservation Commission holds CR #48 on this property.

**BENFIELD HILL** *(formerly known as BENFIELD E)*

This 12.5-acre CCF parcel is located off West Street. The wooded property is protected by CR #46 and is publicly accessible via a trail from West Street through a private easement and Town-owned conservation land (Keystone Link) to Benfield Hill, where there are several loop trail options. There is a certified vernal pool on this property.

**BOSE PROPERTY**

This 0.21-acre parcel along Bedford Road, the only access point to the Concord River from a public way in Carlisle, was acquired by CCF in 2012 to ensure public access for fishing and for launching a canoe. It lies on the old roadbed to the former bridge to Bedford along Route 225 and faces across the river to the Bedford boat landing. The property abuts GMNWR and is near the Foss Farm Conservation Land.

**CAROL BASMAJIAN LAND** *(formerly known as the SWANSON LOT)*

This 2.8-acre parcel along Curve Street, overgrown along the roadway with scrub under Eastern White Pines and mostly wet in the rear, was donated to CCF in 1979 by Paul Swanson in memory of a friend. It abuts Robbins Field.

**CLARK FARM**

This 9.57-acre parcel was purchased by Carlisle residents from the Clark family who had farmed the land through the previous century. The new owners restored the barn and farmhouse, now inhabited by a farmer and his family who manage a new farming operation. They have operated a CSA since 2013, offering organic produce, flowers, eggs, lamb, pork, and seafood. The land is protected by a larger CR that covers additional adjacent property, much of which used to be part of the farm. This property has a trail along its northeastern edge that provides a passage between Concord Street and School Street.

**COTE-FOSTER PROPERTY**

This 5.47-acre CCF parcel is off Acton Street at the Acton town line and is part of a 26-acre assemblage of contiguous lands along West Street. The parcel is wet and contains no trails. Long-term plans are to include this property along with the Taylor gift, Fleming Lot, Pannell Property, and an established trail easement on the Valentine property to create a trail link from West Street to Acton Street, to conservation lands in Acton, and to the Bruce Freeman Rail Trail.

#### **ELLIOTT CONCORD RIVER PRESERVE**

This 8.98-acre parcel is located on Skelton Road. The property is private land but is open to the public. The property was conserved in 2013 when it was sold to the Sudbury Valley Trustees (SVT) by the Rachel Webster Elliott Trust and is protected under CR #65. The Preserve abuts over 900 acres of the GMNWR and provides habitat for two Threatened species in Massachusetts. The trail on the property winds its way through forest and a field. At a fork in the path, visitors can choose to walk uphill to the highest point on the property overlooking the Concord River or to walk along the edge of the wetland and along the Concord River. Near the midpoint of the trail loop, a short trail leads to the Concord River and a landing spot for paddlers.

*Facilities:* There is limited parking available at a small lot off Skelton Road.

*Special Regulations:* A trail easement from the parking lot parallels a neighbor's driveway before entering the woods; visitors are asked to comply with the posted signs and not to walk on the driveway. SVT prohibits motorized vehicles, hunting, trapping, and bicycling.

#### **EMBER LANE CLUSTER**

This 20.86-acre CCF parcel off Ember Lane was gifted to CCF in 1985 by developer Bill Costello. The parcel provides a trail easement along Old Morse Road through a housing development.

#### **ERICKSON LAND**

This 3.79-acre CCF parcel off Fiske Street was gifted to CCF in 2000 by Kristy Erickson. The mostly wet parcel abuts the Holmes-Avery Land to the north and the Town's MacAfee land to the west. It is part of a contiguous group of conservation parcels that extend south to Carlisle Pines.

#### **ESTABROOK WOODS**

This property (94.63 acres in Carlisle) is owned by Harvard University and is protected by a recorded "Statement of Public Charitable Obligation." Estabrook Woods is the core of approximately 1,750 acres of woodland known as Greater Estabrook Woods consisting of Harvard's property and conservation-restricted private and public lands in both Carlisle and Concord.

#### **FIFIELD WORKUM**

This 21.4-acre open space parcel is owned by the Greenough Pond Realty Trust. A trail just outside this property follows the perimeter of the fields in the forest edge connecting the northern and southern portions of the Greenough Land and with GMNWR.

#### **FLEMING OPEN SPACE PARCEL (HIGH WOODS)**

This 5.52-acre CCF parcel, the Open Space for the High Woods Conservation Cluster, is off 662 West Street and is part of the 26-acre assemblage of continuous CCF lands off West Street. These CCF properties enable trail connections to conservations lands in Acton and to the Bruce Freeman Rail Trail.

#### **GREENOUGH PROPERTY**

This 8.22-acre parcel is off Pauline Road and Riveredge Road in Billerica and abuts Carlisle's Greenough Conservation Land. The CCF-owned property is accessible by trail and features a "wood road" that provides the only road access (with a locked gate) to the Town-owned Greenough Land with its barn structure. It provides the land ownership for the footbridge that

allows for the loop trail around Town-owned Greenough Pond. The property also abuts Town of Billerica Conservation Land along the Concord River.

#### **HARTE BYPASS**

This 0.18-acre strip of land was donated to CCF in 2004 to provide a potential connection between the Carr Conservation Land and Harvard's Estabrook Woods. The Rockstrom Trail crosses it, connecting to a trail easement created by CR #69 in 2019.

#### **HOLMES-AVERY PROPERTY**

This 5.37-acre CCF parcel is off Kimball Road. The property is mixed forest and contains a trail that connects to the Town-owned MacAfee Land with important connections to trails in both Chelmsford and Westford, allowing access to the Bruce Freeman Rail Trail.

#### **MACAFEE LAND**

A 2010 property survey determined that 0.73 acres of the Town-owned MacAfee Land is actually in Westford. CCF originally gifted the MacAfee Land to the Town in 1989. CCF retains ownership of this small parcel in Westford.

#### **MALCOLM PRESERVE**

This 10.61-acre parcel on Stearns Street is jointly owned by CCF and TTOR. Contiguous with a senior housing development, the property provides a small handicapped-only parking area along Stearns Street with immediate access to a stone-dust trail that winds through the open field and mixed forest and is handicapped accessible except in winter snow and ice conditions. On another trail, there is a bench where people can rest in the shade while looking over the field. A butterfly garden was planted in 1999 as an Eagle Scout project. The Carlisle Conservation Commission holds CR #53 on the property.

#### **PAGES BROOK RESERVATION**

This 6-acre CCF parcel is off Maple Street near the Greenough Land. The reservation is mostly wetland with no trail access.

#### **PANNELL PROPERTY**

This 11.53-acre, two-lot CCF property is off West Street and is part of the 26-acre assemblage of contiguous CCF lands off West Street.

#### **PINES WOODLOT**

This 15.37-acre CCF parcel is located off Curve Street and straddles the town line with Westford; 12.17 acres are in Carlisle, and 3.19 acres are in Westford. It is bisected by the Tennessee Gas pipeline.

#### **POOLE'S SWAMP**

This 14.5-acre CCF parcel, protected by CR #54, is on School Street. Though the property is mostly wetland, the Rockstrom Trail begins at School Street and follows the southern border heading towards the Rockstrom and Carr Lands to the south and then into the Estabrook Woods. The Poole's Swamp Trail links the Rockstrom Trail with a connecting easement that provides trail access to Woodridge Road.

#### **SORLI FARM**

The recently created CR #67 preserves 20 acres of wetlands, woods, and agricultural fields of the Sorli Farm on the south side of Westford Street. The CR, acquired with CPA funds in 2016, was granted jointly to the Town of Carlisle through its Conservation Commission and to CCF. The property has a public access trail. The CR requires the landowner to maintain agriculture (currently a hayfield) on the property and preserves the distinctive rural vista.

#### **SPENCER BROOK RESERVATION**

This 31.5-acre, three-parcel CCF property is off West Street. Featuring open fields, stone walls, and vistas of the Spencer Brook wetland meadow, the property is easily accessible from South and West Streets and features several trails. Some trail portions are accessible to certain types of OPDMDs (Appendix B). This property is included in BioMap 2's Core Habitat designation.

#### **STALKER LAND**

This 5.6-acre wooded area comprises two parcels off Bingham Road and abuts portions of the 15 acres of open space in the 15-unit Greystone Crossing Development off Cross Street. The property is subject to CR #62, adding protection to a wildlife corridor bustling with birdlife, from a pond on Concord Street to a large maple swamp on Bingham Road, and includes a trail easement and a certified vernal pool.

#### **STEIN PROPERTY** (*formerly RICHARDSON PROPERTY*)

This 4.1-acre CR #64 preserves a field providing a significant rural vista along Skelton Road. It is adjacent to River Road Farm and provides a buffer to the recently created Elliott Preserve.

#### **SUFFOLK LANE LOT**

This 0.24-acre CCF parcel is a narrow strip along the eastern side of the end of Suffolk Lane. It was deeded to CCF in 1988 as a convenience for the developer because it was a remnant of the Suffolk Lane Extension subdivision, separated by the roadway from the house lots. It has no real conservation value.

#### **TAYLOR PROPERTY**

This 3.42-acre CCF parcel is off West Street and is part of the 26-acre assemblage of contiguous CCF lands off West Street.

#### **WILLIAM G. CLARK LAND** (*formerly known as CLARK WOODLOT*)

This 8.8-acre CCF parcel is off Morse Road and is contiguous with the Ember Lane Cluster.

#### **WOODHAVEN FARM**

This 28.7 acre property on Prospect Street was purchased in 2016 by a Carlisle resident and placed in a Conservation Restriction granted to SVT and CCF and dedicated to agriculture. There is a single family home and barn on the property. There is a public trail on the property, which connects Prospect Street to hiking trails in the Davis Corridor.

#### **Publicly Owned Unprotected Land**

Not all public open space is protected for conservation. In Carlisle, significant lands of publicly owned, unprotected open space include the **Conant Land** (54 acres), the **Banta-Davis Land** (39 acres), the **Hart Land** (65 acres), **Department of Public Works (DPW)** land (18.3 acres), **Center Park** (0.6 acres), and the **Moseley Land** (5 acres). These lands were acquired for various town uses and cannot be considered as protected open space.

The **Banta-Davis Land** now provides most of the town's playing fields, but the land is controlled jointly by the Carlisle Public Schools, Select Board, and the DPW and may be designated for town projects other than recreation with approval of the Carlisle School Committee, Select Board, and Town Meeting.

The **Conant Land** contains the Fire House and the Town Hall, but the undeveloped core serves as a natural space, wildlife habitat, and wildlife corridor in the center of town. It was originally purchased for water resource protection for the Town Center. A trail network provides access to its jagged terrain, rugged deciduous and pine forests, wet depressions, dramatic rock outcrops known as Castle Rock, streams, swamps, and links to contiguous neighborhoods. There are four certified vernal pools. Groups of schoolchildren from the Carlisle Schools have visited the Conant Land for natural history walks sponsored by CCF in coordination with Mass Audubon. Parking for the Conant Land is available next to the Town Hall.

**Center Park**, dedicated in 2007, was developed in Carlisle Center between an Italianate residence and the convenience store. Vacant for decades, the land was purchased by the Town in 1974 after a failed effort to develop the parcel as part of a shopping complex. It remained vacant for 30 more years until private fund-raising efforts and donated services resulted in its transformation into a professionally designed landscaped space with memorial granite benches. Center Park also provides much needed additional parking for the Town Center.

The front of the **Moseley Land** is the site of a group home for the developmentally disabled. Per the terms of the Town's purchase of the parcel, the rear of the property may be used at a future time for recreation fields or a community center.

The Town also owns **various small parcels** scattered throughout the town, ranging in size from 0.4 to 6 acres, acquired by the Town in lieu of taxes. Most are wet, lack access, or are too small to be of use. At the request of the Select Board, the Conservation Commission and the Land Stewardship Committee are assessing these parcels to see if any should be protected as conservation land.

The **Town Common** in the historic Town Center is an open parcel of land in front of the First Religious Society (FRS), surrounded by historic churches, residences, and small businesses. The green is cared for by the Town DPW, including mowing and fertilizing. The Common is used regularly for informal children's games, walking by town residents, and as a site for special town events. Both the town and the FRS desire to keep the common as open space. The Carlisle Historical Commission has also expressed interest in preserving this parcel as open space.

Table 10 provides an inventory of Town-owned conservation and recreation properties and facilities in Carlisle. Table 11 provides additional information about the accessibility of these properties and facilities.

## Section 6: Community Vision

- A. Description of Process
- B. Statement of Open Space and Recreation Goals



*The Cranberry Bog was created over a century ago from a grazing meadow and marsh, with private water rights obtained from a Chelmsford landowner, and incorporated as the Nickles Cranberry Company in 1912. The land and 1905 Bog House were purchased by the Town of Carlisle in 1986. Until recently, a local farmer grew cranberries under a long-term agreement with the Town, but the land is no longer an active cranberry operation. The Cranberry Bog Conservation Land remains popular for walking (often with dogs), horseback riding, cross-country skiing, and ice-skating.*

## Section 6: Community Vision

### A. Description of Process

#### Master Planning

The development of this OS&RP has coincided with efforts to prepare a comprehensive Master Plan for the Town of Carlisle. In 2017, a Master Plan Steering Committee (MPSC) began development of a phased planning process and a scope of services needed for engaging a consultant. In April 2018, the MPSC made an interim presentation to Town Meeting. The MPSC noted that the plan would focus on four main topics (Community, Economy, Environment, and Governance) and provided examples of how “Integrated Thinking” linked open space and recreation issues across all four of the main topics. The Town Meeting presentation concluded with an invitation to a community workshop to be held in June 2018.

About 70 residents attended the Ideas Forum at the Carlisle School cafeteria at which they generally agreed that they loved Carlisle because of its open space, nature, schools, and welcoming, interesting people. Among the many “wants” identified by participants were a more vibrant and walkable Town Center, public transportation, a multigenerational community center, more housing options, and more local agriculture with an eye towards food security.

In April 2019, Town Meeting approved \$160,000 in funding: \$135,000 for a consultant and \$25,000 for ancillary expenses. The MPSC developed a detailed Request for Proposals, and the consulting firm Civic Moxie was engaged in September 2019 with a goal of completing the Master Plan by June 2020. Civic Moxie and the MPSC hosted a public forum in November. The November 13, 2019 *Carlisle Mosquito* reported: “Lively discussions took place. . . . Common comments included concern for rising taxes, poor infrastructure, resistance to change, climate resilience, need for public gathering space and a pool, more affordable housing, poor water quality, more sidewalks to make the town more accessible and walkable, increasing traffic, and the need to increase town revenue and to make sure the town is on stable financial footing. Others mentioned shared workspaces, how to address public health issues that will arise from climate change . . . and how the town can better capitalize on open spaces and promote more sustainable farming.”

Results of a short online survey were reported in January 2020. Of 537 responses, the top two reasons people chose to live in Carlisle were open space and natural resources (more than 76% of responses) and the quality of the schools (more than 72% of responses).

At a March 2020 community meeting, the MPSC reported on the 55 “Kitchen Conversations” that had been held in January and February. More than 550 residents had gathered at private homes, in informal groups of 5 to 9 residents each, to discuss land use (using a map featuring open space, pathways, and recreation facilities), a community center (including funding options), and other key issues in town (including prioritizing among them). Civic Moxie also presented posters covering nine topics with draft recommendations. The topics and recommendations of relevance to the OS&RP include the following.

**Energy and Environmental Sustainability:** Pursue the Municipal Vulnerability Preparedness program to fund climate-resilience planning, and consider land use regulations that lead to more compact, walkable, and energy-conserving developments.

**Housing:** Continue to encourage cluster development that allows for a variety of smaller, sustainable housing types on less land while preserving open space.

**Land Use and Zoning:** Ensure that decisions about land use include consideration of multiple town needs including conservation of open space, recreation, housing, and public facilities.

**Open Space, Recreation, and Natural Resources:** With the guidance of an updated OS&RP, coordinate investment in and management of open space, recreation, and conservation lands; protect and promote agricultural activities and sustainable practices; provide new trails and enhance town-wide connectivity; and assess opportunities to acquire conservation land in the context of other town needs and goals.

**Public Facilities and Infrastructure:** Create and support intergenerational community needs by building a Community Center, and investigate advanced wastewater technologies that may allow denser development while maintaining water quality and conservation of other natural resources.

Soon after the March presentation, the COVID-19 pandemic effectively shut down further public gatherings. After several months of efforts by the MPSC to keep the process moving forward via virtual meetings, Civic Moxie resigned in July, citing disagreements with the MPSC over the scope of the Master Plan. The consultant's various work products were provided to the Town in late August. The MPSC and the Planning Board have had several discussions this fall regarding how best to proceed—including reorganizing the committee and hiring a project manager with the remaining consultant funds—but the earliest expected date for a completed Master Plan is now September 2021.

### **Community Support for Open Space**

Notwithstanding the uncertainty regarding completion of the Master Plan, the community input to the planning process to date has reaffirmed the central importance to the community of Carlisle's natural environment—its open spaces, rural vistas, and agricultural pursuits. This is not surprising. Over the past three years, in the process of acquiring Conservation Restrictions (CRs) on two parcels totaling 46 acres and the outright purchase for conservation of 6 acres tied to the expected preservation of an additional 32 acres, the community has been involved in a series of conversations about the importance of preserving open space and a myriad of related issues. These conversations have taken place both broadly and deeply within the community, in public discussions at multiple meetings of, among others, the Select Board, the Finance Committee, the Planning Board, the Community Preservation Committee, and the Conservation Commission. The non-profit Carlisle Conservation Foundation (CCF) was central to the three acquisitions, with the Sudbury Valley Trustees taking the lead on the acquisition of one of the CRs (Woodhaven Farm). The need for Community Preservation Act (CPA) funding led to affirmative votes at the 2016 Annual Town Meeting (\$850,000 of CPA funding for the 20-acre Sorli CR, supplemented by \$52,000 from CCF) and a Special Town Meeting in 2017 (\$500,000 of CPA funding for the Woodward land purchase, supplemented by \$250,000 from CCF), both attended by a broad spectrum of town residents who heard multiple presentations about the importance of preserving open space. Numerous articles, editorials, and letters were published in the *Carlisle Mosquito*, not only about the specific preservation projects but also about the core community value of

preserving open space for current and future residents and for the health of our environment and our community.

Town Meeting (2017) also turned away an effort to roll back the CPA surcharge from 2 to 1%. Conservation Commission Chair Angie Verge read a list of \$4 million worth of CPA-funded projects related to open space preservation, stating, “I cannot imagine how any of these projects could have been funded easily through the general budget.” Steve Tobin, a Director of CCF, noted that “Protecting land these days requires a partnership between public funds, private donations and foundations—a three-legged stool if you will. Let’s not cut the CPA leg in half.” (*Carlisle Mosquito*, May 10, 2017)

### **Community Health Planning Grant**

The Board of Health, Council on Aging, Planning Board, and Gleason Public Library collaborated on a \$20,000 Community Health Network Area (CHNA) planning grant to conduct a community health assessment over 18 months in 2016 and 2017. The Town engaged the Center of Social and Demographic Research on Aging at the University of Massachusetts Boston to gather data through a demographic analysis, a web-based community survey, and three focus groups with community stakeholders and residents aged 18 and up. This initiative—to address the social, emotional, spiritual, and physical health of Carlisle residents across generations in order to facilitate and support health and wellbeing in the community—was called Caring4Carlisle.

The 38-question survey opened with two open-ended questions: one asking respondents to identify the strengths of Carlisle as a healthy place to live and the other asking them to identify aspects of the community needing more attention, planning, or both.

The most frequent responses to the first question were summarized thus: “The aspect of Carlisle that was most often named as positively impacting quality of life was the natural amenities in the area. Most of the respondents mention it explicitly by reporting their enjoyment of conservation land and use of the walking trails. Some attributed the big, open spaces and quality of rural land to ensuring the serenity of small town, rural living.” (*Caring4Carlisle: A Community Health Needs Assessment, 2016-2017*, pp. 19-20)

Issues identified as needing attention included the cost of living (high taxes), a lack of housing diversity seen as especially affecting young families and seniors, transportation challenges, and limited social and cultural opportunities in town. Satisfaction levels with available services and programs were highest (“Very satisfied”) for natural amenities (88%) and schools (68%). Respondents were generally satisfied with recreational programs in town, with 37% “Very satisfied” and 36% “Somewhat satisfied.”

Of the 480 survey respondents, 98% reported their quality of life to be “good” or “excellent.” Nearly half reported having a friend or family member affected by substance abuse. The concern related to children living in Carlisle most frequently cited was that they spend too much time in front of screens (phone, computer, TV).

Half of respondents answered “No” to the question: “Are there sufficient places to go to socialize or for leisure activity?” Some suggested that what is needed is a freestanding senior or

community center, with a smaller number expressing a desire for a pool, health club, or recreational facility in town.

Focus group participants highlighted the need for cars since there is no public transportation available in town. Concerns were expressed about pedestrian and cyclist safety. A fear of tick-borne diseases was found to affect residents' likelihood of taking advantage of the extensive conservation lands in town.

The report of the initiative concludes with recommendations to achieve the goal of a healthier Carlisle. These recommendations include providing information regarding tick-borne illnesses and preventative measures, evaluating the need for connecting pathways to encourage more walking, and developing a plan for a community center.

Following the completion of the study, a \$30,000 CHNA implementation grant was received, with the bulk of the grant used to fund a Community Center feasibility study by Abacus Architects. (See Appendix G.)

### **Past Planning Efforts**

Since 1974, Carlisle has formally solicited input from its citizens about what the long-term plans for the town should be. In 1974, 1985, 1990, 1994, and 2009, Carlisle residents were asked by questionnaire about the kind of community they wanted. The responses have been remarkably consistent over the years, particularly those related to shaping the physical environment of the town. Goals for Carlisle in 2020 are generally consistent with town goals for the past 40 years.

“A Study Plan for the Town of Carlisle,” was completed in 1995. Although the “Study Plan” was developed 25 years ago, it remains relevant because it is the last comprehensive plan developed by the town before the one currently under development; interim planning efforts have been focused on more limited areas of study, such as housing or open space and recreation. Additionally, as demonstrated by the statement in 1995 that the values had remained unchanged for the previous 20 years and the summaries of some of the more recent, more focused plans and surveys discussed above and below that show that the goals identified in 1995 have continued for 25 more years to be the goals of the community, this consistency is central to the findings of this Plan. The “Study Plan” includes the following statement.

That townspeople greatly value the rural appearance of Carlisle can be seen from the results of questionnaires of 1974, 1985, 1990, and 1994 and the Community Planning Days of 1992 and 1993. Residents consistently value the remaining natural views along Town roads, appreciate the rural vistas, and enjoy the open spaces of Carlisle. The significance of this issue is so great as to take precedence over all other issues to townspeople. Although there has been a substantial turnover of residents, the significance of this issue has not changed in more than 20 years.

As part of the mid-90s Master Planning effort, the Planning Board held a Planning Day in 1992, followed by Master Plan meetings, each one devoted to a specific aspect of the plan. Community goals were sorted into the value categories of Rural Character, Safety, Community, and Education, which were described in 1995 in “A Study Plan for the Town of Carlisle.” Among the Action Recommendations of the 1995 Study Plan were the following. [Bracketed notations

document recent town initiatives that confirm the currency of the recommendations from 1995 relating to Open Space and Recreation.]

- Enhance the rural aesthetic of the town and maintain the perception of rurality in the most reasonable and achievable manner. Encourage the use of conservation easements and conservation restrictions (CRs). Purchase development rights and use other preservation mechanisms for the protection of selected undeveloped parcels. [Since 1995, 841 acres of land have been placed under CR protection. Of this total, 76.64 acres, which comprise *all* properties ranked as top priorities for protection in the 2013 OS&RP, have been protected since 2013.]
- Acquire open space properties to enhance the rural aesthetic in keeping with the recommendations of the Open Space and Recreation Report and reduce the impact of new development on the provision and quality of town services.
- Evaluate and update the Conservation Cluster Bylaw, the Zoning Bylaw, and the Subdivision Rules and Regulations to ensure that the rural aesthetic is given paramount importance in the town's regulatory structure. [In 2017, as part of the effort to preserve the majority of the Woodward/Doutriaux property, the Town adopted a Residential Open Space Community Bylaw that requires a set-aside of 1.8 acres of open space for every unit of cluster housing.]
- Protect residents' drinking water. Safeguard the town's water supply and groundwater resources.
- Meet the needs for housing alternatives for those of moderate means, including seniors, town employees, and adult children of town residents, or those for whom the existing housing stock is unsuitable, in the interest of the community as a whole.
- Maintain the scenic qualities of old and new town roads while making them as safe as possible, explore techniques to reduce commuter traffic, and provide safe ways for pedestrian and non-motorized traffic. [In 2019, the Town supplemented a \$250,000 MassDOT Complete Streets grant with an additional \$50,000 appropriation for a major safety redesign of the Center rotary, safer crosswalks, and nearly 1000 feet of new sidewalks in the Center. The work was completed in 2020.]
- Preserve and extend the trails system, creating more trail linkages across town. Encourage research and investigate funding to annotate historic and natural features, and investigate incentives for landowners to donate trail linkages. [Since 2013, several new trails, altogether almost 4.5 miles, have been added to the trail network along with 832 feet of new and rebuilt boardwalks in 22 locations and 288 feet of duckboards in 13 locations. A staircase was built to provide better trail access on the Russell Conservation Land. An effort is underway to place benches at favorite viewing points, with 13 installed to date. The Trails Committee and CCF celebrated the trails system with a Carlisle Community Trails Day Challenge in May 2019, with over 275 residents and their friends collectively walking 760 miles, covering all the trails in Carlisle in a single day. This effort to bring the community together became more virtual for the Second Annual event due to the COVID-19 pandemic: Trails Day was expanded to the entire month of June, and walkers

were encouraged to walk alone or with a few close friends and to maintain social distancing. The *Carlisle Mosquito* (July 23, 2020) summed it up well: “This strange time has provided us an opportunity to slow down and reflect on the beauty around us and on the blessing we have to live in a relatively safe natural environment.”]

- Preserve and enhance the high quality of our schools.
- Support the inclusion of meeting space for the purposes of social and educational functions in the plans for new town offices, library, or other town facility. [As noted in Appendix G, the community has developed preliminary design plans for a multigenerational Community Center.]

## **B. Statement of Open Space and Recreation Goals**

In defining open space and recreation goals for Carlisle, the town’s highly valued rural character must be emphasized. Rural character is predicated on harmony between natural and human-made environments. In order to enhance the visual quality of Carlisle and the perception of open or natural space and rural characteristics, the following goals were established in “A Study Plan for the Town of Carlisle” (1995).

- Encourage and protect the use of land for agriculture.
- Maintain large undeveloped parcels, with connections that serve as wildlife corridors and provide for trail links.
- Protect natural and historic features.
- Protect historical, social, and aesthetic features of the Town Center.
- Encourage variety of size, style, and setback of housing, with flexibility in the use of open space.
- Maintain overall 2-acre density in order to protect the natural resources of the town. Require roads that are sensitive to and preserve the natural environment and preserve the traditional components of the landscape, such as stone walls and fences.

Related community goals are the following.

- Maintain mutual respect for the different ways that and the degree to which individuals participate in the town’s activity offerings.
- Maintain inclusiveness of diverse populations.

These last two goals necessitate ensuring access for people with disabilities to a variety of conservation and recreation facilities in town.

“A Study Plan for the Town of Carlisle” states that the town should continue to “protect and preserve undeveloped land by purchase or other means.”

The Study Plan virtually ignored the need for additional facilities for active recreation, but there was significant community support for plans put forth by the Recreation Commission for

additional fields in 1998 (when funding for new fields was approved) and in 2006 (when funding failed to gain approval by very small margins on two occasions). In 2019, Town Meeting approved \$20,000 for a detailed study of issues limiting the use of Spalding Field, important for school and recreational athletics, with an eye towards further expenditures to address the issues.

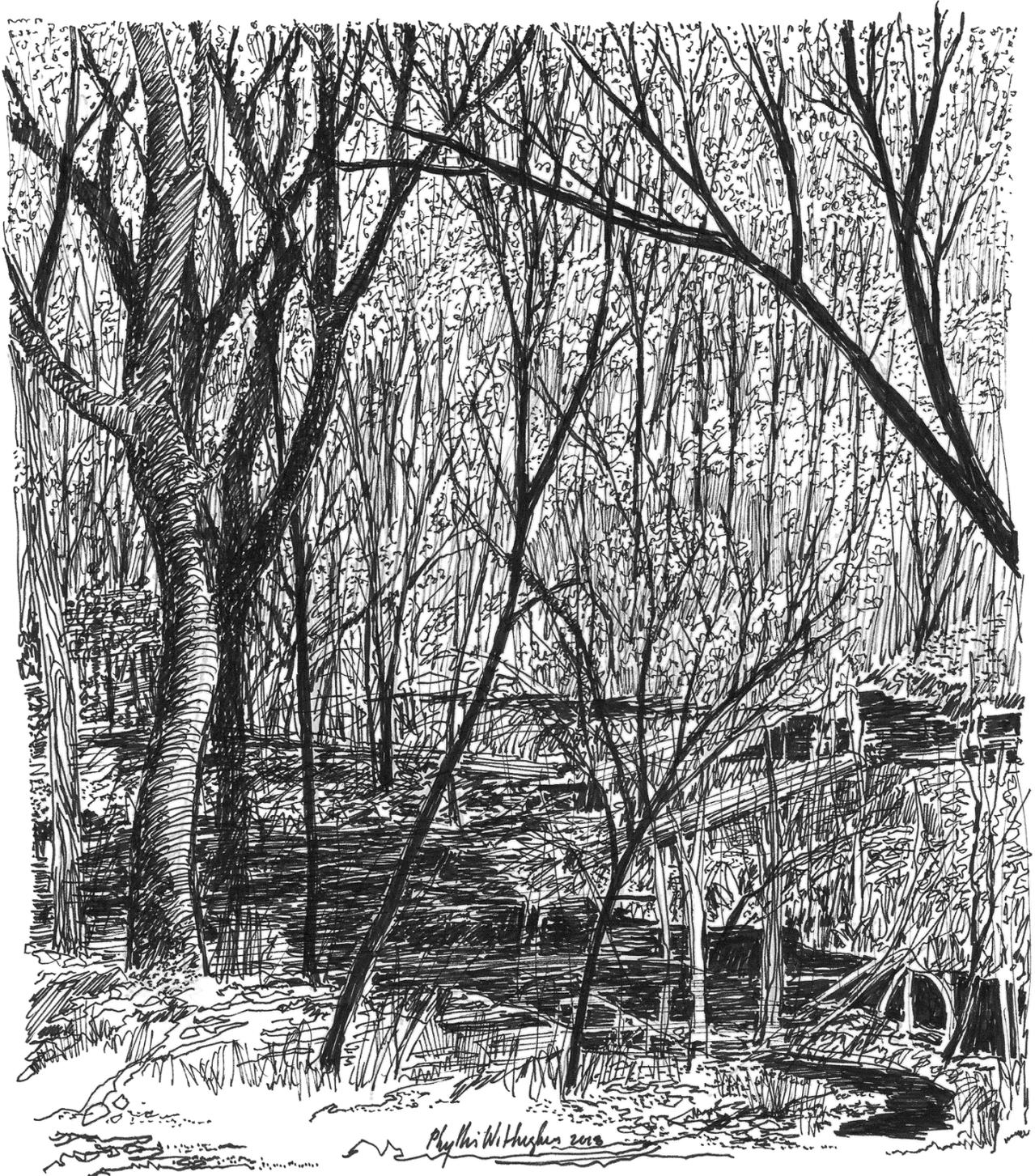
Although today the community is facing economic pressures from high taxes in a challenging economy, the goal that still resonates consistently through the public outreach from the Master Planning process noted above—and the town’s ongoing investment in time and money for pathways, trails, CRs, and purchases of land for preservation—is that of preserving Carlisle’s open spaces and rural nature. As noted above, citizens have expressed support for the goal of having adequate opportunities and resources for recreation, both through their use of existing trails and other outdoor recreation opportunities and their support for more venues for recreation and social activities.

There is also increasing understanding of the need to maintain and protect existing open space and recreation areas through good management practices, including the development of baseline assessments and management plans. Some citizens and public officials have noted that maintenance of existing Town-owned open space is already underfunded. Similar concerns have arisen with deferred maintenance of Town-owned buildings. Addressing this issue will be critical in any efforts to add to the inventory of Town-owned conservation land and municipal buildings such as a new Community Center.

As noted above, among the themes in public feedback as part of the Master Planning process is the need to assess decisions about land use—including the acquisition of land for conservation or recreation—relative to multiple town goals. Given the almost exclusively residential tax base, the slowdown in development over the past 20 years (due in part to a decreasing inventory of easily developable land), the expectation that future growth may continue to be moderate at best, and the limited opportunities for commercial development, merely maintaining current services (including core needs such as schools, public safety, and Town Hall staffing) can be expected to move tax rates higher year after year. Proposals to conserve land through acquisition will be balanced against potential tax revenue of the land if left to development (balanced by the potentially increased cost of providing municipal services to additional residents). Desires for housing that is affordable (whether subsidized and priced to meet state affordability standards or just more affordable to attract young families to counter decreases in the school-age population) will also need to be considered. Given the already high tax base, high land costs in Carlisle make all land acquisitions—whether for conservation, recreation, municipal uses, or housing—challenging.

## Section 7: Analysis of Needs

- A. Summary of Needs for Resource Protection
- B. Summary of Community's Needs
- C. Management Needs



*Tophet Swamp is the southernmost section of Great Brook Farm State Park; it includes a loop trail punctuated by boardwalks.*

## **Section 7: Analysis of Needs**

In this section, the needs of Carlisle are analyzed, and this analysis is informed by several considerations: past successes in preserving open space (particularly progress over the past seven years as outlined in Section 2), the slowdown in residential development, decrease in the town's population, other demographic changes as outlined in Section 3, and the importance of preserving and protecting the town's current inventory of water and land resources for private water supply, wildlife habitat and corridors, recreation, and aesthetics as outlined in Sections 4 and 5. As outlined in Section 6, the community has been consistent over the past 35 years in supporting the goal of protecting open space to preserve and enhance the rural character of Carlisle. Additionally, citizens have expressed support for the goal of supplementing existing opportunities and resources for recreation, including support for more venues for recreation and social activities. In addition to recognizing a need for conservation and recreation, the community has also recognized a need for excellent schools and housing diversity.

### **A. Summary of Needs for Resource Protection**

Carlisle's population has stabilized, and there are fewer remaining undeveloped large parcels than there were in 2013 (fewer still without wetlands or both wetlands and access issues that would make them easily developable), so the town needs to take a targeted approach if it wishes to protect additional open space for groundwater protection, conservation, and recreation. The town also needs to address the issue of climate change and associated effects on our local, regional, and global environment. As noted in the discussion of different New England Landscapes Futures development scenarios at the end of the Section 3 (pages 3-14 through 3-16), what happens in neighboring communities and beyond is likely to have a greater effect on our natural environment than what happens in Carlisle alone. In addition, the more development intensifies around us, the more preserved open spaces and agricultural land and generally dispersed development in Carlisle may increase in regional importance.

#### **Need for Groundwater Protection**

Individual wells supply Carlisle residents' drinking water, and safeguarding the water supply is critical. Studying aquifers and protecting surface waters and wetlands are important to maintain the quality of the groundwater. Recognizing that town planning is essential to ensure that water quantity and quality are maintained, the Board of Health (BOH) has recently re-established its Water Quality Subcommittee. Planning for a possible town-wide public water supply is not currently a high priority; the committee convenes as needed to address infrequent, localized, water-contamination issues.

Due to the high cost of land, development on 2-acre parcels continues to be primarily large, million-dollar homes, whether on newly developed parcels or replacing smaller tear-downs. These homes tend to come with larger lawns and more impermeable surfaces. Larger lawns are a double threat to groundwater resources with the increased demand on groundwater from sprinkler systems and the runoff from herbicides, pesticides, and fertilizers. Increased stormwater runoff from the increased impermeable surfaces can harm wetlands and groundwater. Denser development—such as is contemplated by the recently enacted Residential Open Space Community bylaw—is tied to a requirement for significant open space protection. The 18 clustered homes planned for Woodward Village—permitted but not yet built—will be sited

on less than 10 acres of the 42-acre parcel, with the remainder to be permanently preserved open space (with an allowance within the open space for the development's public water supply).

Carlisle has preserved or reserved some possible sites for public water supplies (the Hart Land in the northwest part of town and the former O'Rourke property of Great Meadows National Wildlife Refuge (GMNWR) in the southeast) should groundwater sources become depleted or extensively polluted. Additional sites would be needed to provide sufficient water for the entire town; limited aquifer areas are identified on Map 6: Water Resources. Public education about the following issues relating to groundwater supply—a shared natural resource—remains important: collecting runoff in rain barrels for irrigation, landscaping with plantings that require less water than residential lawns require (xeriscaping) to reduce irrigation demand, managing sources of pollution, and minimizing use of herbicides and pesticides.

### **Needs for Conservation**

#### **Protect Additional Open Space.**

The high value that Carlisle continues to place on conservation is demonstrated by the Town's adoption of the Community Preservation Act (CPA) in 2001 and its reaffirmation in 2011 and 2017 and strong public support in recent years for the purchase of conservation land and CRs as detailed on page 6-2. The high cost of land will continue to make open space preservation a challenge, especially with other priorities competing for limited municipal financial resources. Although outright purchase of parcels for conservation remains important, cluster developments are more cost-effective; they provide tax revenue from the new homes while adding to Carlisle's open space through special permit requirements. Cluster development models that reduce sprawl and require open space preservation should continue to be promoted.

#### **Protect Wetlands.**

As noted in Section 4, wetlands are a common feature in Carlisle. Wetlands on protected lands play a vital role in flood control and water purification and serve as habitat for a variety of species, both flora and fauna. Wetlands on non-protected lands are equally important, if not more so, due to the increased stormwater runoff and pollution from developed lands. The Town should remain vigilant in its protection of wetlands, working to educate homeowners not only on the wetland bylaw requirements, but also on the importance of wetland protection in a town that relies on groundwater for its water supply. As noted in Section 9, the Conservation Commission plans to review and update the local wetland bylaw and policies including more stringent replication standards and revised local definitions of wetlands to further protect vernal pools.

#### **Protect Large Parcels.**

The number of large, single-owner parcels in Carlisle still available for conservation has diminished since the 2013 Open Space and Recreation Plan. A significant portion of the Sorli farm fields, identified as a priority in the 2013 plan, has been preserved with a town-purchased CR. (See Table 7 for the updated Property Protection Priority List for parcels of 10 acres or more.)

#### **Facilitate Land Stewardship.**

The Conservation Commission and its Land Stewardship Committee must continue to focus on maintenance and monitoring of existing Town-owned conservation lands, including improved signage, trash and invasive plant clearing, development of management plans, and other

activities. The Carlisle Conservation Foundation (CCF) plays a similarly important role on its more than 200 acres of fee interest (ownership) properties. As noted below in the section on Native Pollinators, stewardship might include the establishment and maintenance of native wildflower meadows on conservation lands and other Town-owned parcels.

### **Facilitate Trail Stewardship.**

The Trails Committee continues its excellent efforts to maintain and expand Carlisle's trail system. It will need town support to create additional parking near popular trailheads. It hopes to survey trail signage to assess opportunities for signage for people with disabilities and to survey existing trails for opportunities to make portions of them more accessible to people with disabilities.

Developing a sustainable and environmentally sound strategy for controlling Poison Ivy on conservation land, particularly along trails, remains a goal of the Conservation Commission and the Trails Committee and continues to be a challenge.

The Trails Committee published an updated trail guide in 2018. The trail maps are also available online at the Trails Committee's website. The Trails Committee uses its website to document and communicate trail-management issues.

### **Create Trail and Protected Parcel Linkages.**

Carlisle should continue its fine work to acquire more important linking parcels that abut existing protected parcels. Such linkages are important for extending and creating wildlife corridors, for water-resource protection, for trail connections, and as additional buffers to residential development. Specific linkages that would enhance trail connections for the town are included in Section 9 at the end of the Trails Committee's Seven-Year Initiatives. Several of these linkages are highlighted in Map 8: Seven-Year Action Plan.

Another effort is the joining of neighborhoods through connections that are not dependent on the use of automobiles. Pathways developed thus far along major roads have improved pedestrian access from Carlisle Center. The improved, ADA-compliant pedestrian crossings in the Center allow more residents, especially students at Carlisle's school, to get to and from the school (and the library) safely on foot. Wetlands along roadways, particularly along Westford Street, are a major obstacle to expanding the pathway system beyond the Center. Widening of rights of way will require significant funding and engineering expertise as well as wetlands permitting.

### **Need to Encourage Agriculture**

Economic pressures on landowners with land in agricultural use (in Carlisle and elsewhere in the state) cannot be underestimated. The town should monitor existing agricultural operations in Carlisle and provide support as necessary to help them remain viable. Continued existence of the agricultural operations—particularly those using organic farming techniques—supports the aesthetically pleasing rural nature of Carlisle, supports proper stewardship of the land, provides locally grown food, and helps keep land from residential development, thus protecting natural resources. The town should continue to support the Agricultural Commission (AgCom) and initiatives such as the Farmer's Market to encourage local agriculture and the annual Seed Swap sponsored by the Carlisle Garden Club with help from the First Religious Society's Environmental Action Committee.

The AgCom was created by 2013 Annual Town Meeting (ATM) and first met in Spring 2014. The mission of this 5-member committee is to encourage the continued pursuit of agriculture in Carlisle by providing resources for farmers and advocating for the preservation of agricultural lands. The AgCom developed a Right to Farm Bylaw—passed by 2019 ATM—based on bylaws in some of Carlisle’s neighboring communities. (See Appendix L.) The purpose of the bylaw is to reinforce rights enshrined in state statute (particularly MGL Chapter 40A, Section 3, which enumerates subjects—including commercial agricultural use of land—that may not be regulated by local zoning) and to incentivize best practices by local commercial farmers, thereby minimizing disputes with neighbors and encouraging amicable resolution of disputes when they arise.

For the past several years, the Agricultural Preservation Restriction (APR) Program has been under review by the Massachusetts Department of Agricultural Resources (MDAR). (See page 8-3.) They have been holding “Listening Sessions” across the state to hear from landowners, farmers, state officials, land trusts, and other stakeholders to gather input towards modernizing the APR Program to help ensure the long-term viability of APR farmlands. The APR Program seeks to protect valuable farmland soil by paying farmers the difference between the fair market value and the agricultural value of their land in exchange for a permanent deed restriction that prevents use of the property for the types of development that will hinder its future agricultural viability and potentially be detrimental to the environment. The Agricultural Commission should monitor progress on this front, especially given the relatively small size and limited productivity of farming operations in Carlisle.

These efforts to preserve remaining farmland are predicated on the decrease in farmland statewide over the past twenty years. Middlesex County showed some of the greatest decreases in cropland between 2007 and 2012 with a 30.4% decrease in acreage over that period (United States Department of Agriculture, Census of Agriculture, 2012). The New Entry Sustainable Farming Program (NESFP), an initiative of Tufts University’s School of Nutrition Science and Policy and other stakeholders is dedicated to preserving farms by seeking and educating a next generation of farmers. NESFP projects that 10,000 new farmers are needed in Massachusetts to prevent the loss of more farmland; it has trained 2,000 and is working to get 1,500 additional new farmers in the Commonwealth. Early in 2019, the Middlesex Conservation District (MCD) and the Citizen Planner Training Collaborative of the American Planning Association co-sponsored a conference in Acton entitled “Growing Locally: Open Space, Farms, and Housing: Is There Room for All?” to help planners and advocates in local communities think about how to balance increasing demands on limited land. At this conference, NESFP representatives noted that “...perhaps the greatest need is for community support. This can include envisioning farming as part of an open space plan, providing affordable farmland and housing to those working the land, advocating for farmers, volunteering to help at farms, and purchasing food locally.” (*Carlisle Mosquito*, February 27, 2019)

This plan supports efforts to make the continued practice of agriculture and, when and if financially feasible, the expansion thereof, a priority in local land planning decisions. AgCom should take a leading role in these efforts.

### **Need to Address Climate Change**

In July 2020, Carlisle applied to the Executive Office of Energy & Environmental Affairs (EOEEA) for a grant under the state’s Municipal Vulnerability Preparedness (MVP) program. The application affirms Carlisle’s commitment to sustainability, citing a study entitled *Path to Zero Emissions: Creating a Sustainable Carlisle* released in March 2020 by the Carlisle Energy Task Force (ETF). If received, the grant will be used to undertake a town-wide assessment of the local risks and hazards of climate change and to solicit feedback from the community regarding the adoption of sustainability goals and incorporating those goals into future planning efforts. The effort will seek to define local vulnerabilities and to develop actions to be taken, such as, for example, the local development of alternative energy resources, the protection of key parcels, or providing support for local agricultural operations. The goal would be to develop one integrated plan that meets both FEMA Hazard Mitigation Plan (HMP) and MVP requirements. The town’s HMP—which seeks to reduce disaster losses through the development of strategies for minimizing damage, including the incorporation of green infrastructure to address local flooding and protect water quality—expired in 2017. [Carlisle received a \$27,000 MVP grant late in 2020. The grant funded a Climate Resilience Building Workshop facilitated by members of the Metropolitan Area Planning Council (MAPC) in March 2021. The workshop, held virtually via Zoom, was attended by almost 40 Carlisle residents.]

With the leadership of the ETF, Carlisle has made strides towards reducing the town’s carbon footprint. Since receiving Green Community designation in 2011 and subsequent state grants and utility incentives, the Town has improved the energy efficiency of municipal facilities, reducing municipal greenhouse gas emissions by 20%. Town-coordinated promotion of two solar photovoltaic programs has resulted in the addition of residential rooftop and backyard solar photovoltaic panels that meet about 6% of local residential electrical demand. In July 2018, Carlisle entered into a Community Choice Aggregation Program with a default offering of 100% renewable energy, further reducing energy costs and greenhouse gas emissions; the program was renewed in fall 2020 for the next three years. In 2020, solar-electric panels were installed on canopies over the Carlisle Public Schools’ parking lot; this installation is expected to generate \$676,000 in lease payments to the town over the next 20 years. Through efforts of the Household Recycling Committee, community composting bins have been added to the Transfer Station with a goal of reducing solid waste by 30%. Further progress towards sustainability will require the efforts of the entire community.

Local protection of additional open space, one of the core goals of this OS&RP, helps mitigate many of the damaging effects of climate change. Forests sequester carbon and cool the understory. Vegetation and wetlands filter pollution and contaminants from the air and drinking water and slow the release of stormwater, reducing the severity of floods. Concomitant economic benefits include both reduced medical costs and less property damage.

### **Need to Protect Pollinators**

#### **Honey Bees**

Carlisle beekeepers have experienced severe difficulties with survival of their Honey Bee (*Apis mellifera*) colonies since at least 2005. From 2005 through the winter of 2018-2019, most local beekeepers reported a significant decline in the health of their hives such that many Carlisle

beekeepers lost all or most of their colonies over the winters of 2017-2018 and 2018-2019. There may be, however, some hope on the horizon. Four Carlisle beekeepers who managed a total of 17 hives over the winter of 2019-2020 reported improved hive survival and honey production. Two beekeepers reported that all of their hives survived (seven hives in total), one beekeeper reported a 50% loss (four of eight hives lost), and one beekeeper reported the loss of both his hives early in the fall. The two beekeepers whose hives all survived had moved some of their hives to Chelmsford, one because his gardens are there and the other to take advantage of an area with more sunny, open fields. Although the beekeepers see the mini-resurgence as positive, they didn't know why it had happened and noted that, so far, the improvement has been for only one year.

The Commonwealth of Massachusetts no longer maintains a beehive registration and inspection program, so at this time the number of local beekeepers and the hive survivability rate is difficult to determine. The Town may benefit by working with the Middlesex County Beekeepers Association (MCBA) to register beehives and monitor their locations and the health of the bee colonies. The Town could also perform an annual survey of beekeepers to monitor changes over time.

In 2015, the Harvard University School of Public Health published a study on neonicotinoid distribution in Massachusetts pollen and honey. Neonicotinoids are a class of pesticides that are believed to be toxic to bees. Neonicotinoid use is banned in the European Union, and recent research indicates that it may be related to Honey Bee population collapse. The Harvard study found neonicotinoids in all four hive locations in Carlisle at concentrations that are deleterious to Honey Bees and various bumble bee species ([researchgate.net/publication/282222257](https://www.researchgate.net/publication/282222257)). The Town may benefit by sponsoring a pesticide testing program to detect neonicotinoids in local pollen and in wells.

Although there have been few documented swarms in recent years, the Town could benefit by alerting the police and public to the Swarm Control program that is conducted by the MCBA whose members can opt to be notified by email about a local resident's sighting of a swarm. This notification usually yields a rapid response by a local beekeeper. Collecting a swarm can result in establishing a new colony.

In addition, the Town may wish to support pending State legislation, Representative Carolyn Dykema's bill, H.763 – An Act to protect Massachusetts pollinators. This legislation, although not going as far as the European Union's legislation, would curtail some use of the neonicotinoids.

### **Native Pollinators**

The North American Pollinator Protection Campaign promotes public awareness and habitat conservation and provides valuable resources including planting guides. National Pollinator Week, established by the U.S. Senate in 2007, is celebrated in Massachusetts each June with workshops and activities.

Carlisle could adopt the recommendations from Great Barrington's example and expand upon them with specific suggestions that would not only support pollinators, such as bees, wasps,

butterflies, moths, flies, beetles, and hummingbirds, but also support a wider variety of insects, thereby promoting substantially more biodiversity. (See page 4-36.) Additional local efforts by homeowners that are easily achievable might include

- mowing lawns less frequently and leaving grass at least 4 inches high (so it will flower);
- maintaining a polyculture lawn by tolerating beneficial, low-growing, pollinator-friendly plants;
- following organic lawn management that eliminates, in addition to pesticides, synthetic fertilizers and herbicides;
- allowing autumn leaves to remain on garden beds year-round to promote arthropod predators, which are important to a balanced ecosystem;
- leaving small, almost completely bare, sandy-soil patches on south facing slopes for ground-nesting bees;
- permitting an assortment of beneficial volunteer native “weeds” to inhabit garden beds and woodland edges;
- creating brush piles in wooded areas;
- leaving snags to stand wherever safe to do so;
- allowing fallen trees to remain on the forest floor; and
- increasing areas populated with a variety of successively blooming native herbaceous plants, shrubs, and groundcovers in lieu of large grass lawns.

Additional efforts by the Town might include

- increasing native plant species by removing introduced and especially invasive plant species on conservation and other Town lands as well as landscaped areas;
- enhancing the Town website with information on pollinators, beneficial insects, and plants native to Middlesex County;
- supporting information-sharing forums on private landowners’ experiences and discoveries promoting biodiversity;
- creating demonstration beds of native plants, which would also be sources of seeds and cuttings for homeowners;
- establishing a Biodiversity Committee to aid in the administration of the above suggestions; and
- creating pollinator gardens at Carlisle’s schools and integrating them with subjects such as math, science, art, health, and physical education. “Children can serve as ‘pollinator ambassadors’ in their homes and communities, as their enthusiasm can influence families and friends to establish home pollinator gardens.” (Quotation and information above from “Great Barrington Pollinator Action Plan: Connecting Habitat and Community,” Abramson, Bills, & Ruhl, 2018.)

Native wildflower meadows could be encouraged on private land and established on conservation lands and other Town-owned parcels. Wide mowed paths and wood-chipped borders could minimize contact with ticks. The first several years of developing a perennial meadow would require extra maintenance to prevent invasive plants from establishing, suppress native “weeds,” and prevent secondary succession from herbaceous to woody plants, resulting in the eventual conversion of fields to forests. Subsequent periodic maintenance activities would include mowing; removal of woody, weedy, and invasive plants; and over-seeding.

## **B. Summary of Community's Needs**

The 2017 Massachusetts Statewide Comprehensive Outdoor Recreation Plan (SCORP) identified open space and recreational needs for Massachusetts and the North Region, which includes the Town of Carlisle. The SCORP notes that protecting land for outdoor recreation and open space is critical to the quality of life of residents and to the economic vitality of the state.

Carlisle is fortunate to have had forward-thinking residents in the past who urged the acquisition of large tracts of land for preservation and future public use. Carlisle's central location between circumferential I-95 (Route 128) and I-495 and radial Routes 2 and 3 brings increasing numbers of visitors to these protected properties to take advantage of many of the amenities identified in the SCORP.

The needs of the community are best expressed by a description of the resources currently being extensively used by large numbers of Carlisle residents and visitors. To meet these needs, the various resources and facilities must continue to be protected and maintained, with appropriate allocation of funding from federal, state, and local resources.

Great Brook Farm State Park (GBFSP) draws many visitors year-round, not only for the demonstration farm itself, but also for the extensive trail network available for walking, mountain biking, dog walking, nature study, horseback riding, and the cross-country skiing business in the State Park. The trails are also used by cross-country running and cross-country skiing teams representing schools from several towns. The New England Mountain Biking Association (NEMBA) coordinates work parties to do maintenance work on the park trails.

Hikers and cross-country skiers also frequent other Town-owned conservation lands, especially Foss Farm, the Towle Land, the Cranberry Bog, the Greenough Land, and the Davis Corridor.

The partially completed Bruce Freeman Rail Trail through the communities of Lowell, Chelmsford, Westford, Carlisle, Acton, and Concord, eventually to reach Sudbury and Framingham, passes through just a corner of Carlisle at the Acton border just east of Route 27, providing access to miles of trails open to non-motorized uses such as cycling, jogging, walking, and cross-country skiing.

Carlisle's two major through roadways have two marked lanes with narrow shoulders. Its side roads are narrow, winding, and generally without shoulders. Nevertheless, the town has become increasingly popular with road bicyclists, now seen year-round.

Facilities for active recreation including fields for baseball, softball, soccer, field hockey, and beach volleyball are available on the Banta-Davis Land and Spalding Field. The school campus is home to tennis courts, public playground facilities, a tot-lot, basketball hoops, and a kickball area. For over 35 years, Foss Farm has provided riding rings for youth horseback riding and trails used seasonally for training sled dogs.

Nature walks focusing on birds, dragonflies, plants, mushrooms, lichens, and vernal pools open to the public were seasonally available pre-pandemic. Residents and visitors alike enjoy the agricultural vistas in GBFSP, Foss Farm, Fox Hill, Bisbee Land, and the Carlisle Cranberry Bog.

Foss Farm includes an area with more than 100 community garden plots, enjoyed by residents and non-residents alike. Some of the gardeners grow produce for sale at the Carlisle's Farmers' Market.

The Carlisle Trails Committee maintains more than 35 miles of interconnecting trails around town, excluding the approximately 20 miles of trails in GBFSP. The Committee tries to provide walking trails to new neighborhoods as they are developed.

Carlisle has little surface water for water sports. There is a launch area at GBFSP for canoeing on a large pond and limited canoeing is available on Greenough Pond and the Cranberry Bog, both shallow flooded wetlands. Greenough Pond is fished from its dam during the warmer months and is used for ice fishing, ice skating, and pick-up hockey games during the winter. Carlisle residents can access the Concord River for fishing and boating from a small piece of CCF-owned land at the Route 225 bridge in Carlisle, but access is more easily obtained from the boat launch areas across the river in Bedford or in Concord. There is a canoe-landing spot on the Elliott Concord River Preserve. The Concord River as it flows past Carlisle is part of the Sudbury Assabet Concord Wild and Scenic River system and also part of GMNWR. It is popular for motorized boating, fishing, canoeing, bird watching, kayaking, rowing, seasonal duck hunting (where permitted), and nature photography.

Carlisle remains open to hunting on private property with written permission of the owner and on U.S. Fish and Wildlife Service property with a permit.

As Carlisle and surrounding towns continue to develop, use of our open spaces will increase, providing a valuable resource to the surrounding region.

### **Needs for Active Recreation**

#### **Support Current Active Recreation Programs.**

The Recreation Commission and volunteer organizations offer a variety of popular athletic programs, which serve children and adults from both Carlisle and surrounding towns.

Youth programs for baseball, softball, T-ball, lacrosse, football, soccer, and ice hockey are combined with Concord. The Carlisle Middle School offers a variety of outdoor sports to students, including cross-country running, soccer, baseball, softball, and field hockey. Middle school students use the Spalding and Banta-Davis Fields after school during both fall and spring.

Although demand for athletic fields has grown, Carlisle has not added to its inventory of athletic fields in almost 20 years. During peak season, all Carlisle's athletic fields are being used at or beyond capacity, damaging the turf. Fields are shared with Concord, but Carlisle provides a smaller percentage of fields than the percentage of Carlisle participants in each sport. This deficit is particularly true of sports that are best played on artificial turf (lacrosse, field hockey, and soccer). The recently authorized Spalding Field study will consider the feasibility of artificial turf, which has the added advantage of allowing more uses than natural turf fields. With a refurbished Spalding Field including an artificial turf field, the natural turf fields would not be overused and would be easier to maintain. In addition, Carlisle would be able to provide its fair share relative to what is provided by Concord.

Given the need for more fields in Carlisle, the Recreation Commission remains concerned about potential new proposals to use areas adjacent to existing recreation facilities on the Banta-Davis Land for municipally supported affordable housing. Aside from facilities on school property, the Recreation Commission currently has no in-town alternative to the Banta-Davis Land for recreation facilities. Their central location makes Banta-Davis and Spalding Field ideal sites for the town's outdoor recreation facility, as they are connected to the Carlisle Schools' property, providing convenient access for student athletes both during and after school. The consolidated facility also provides efficiencies for maintenance and infrastructure, including irrigation and parking. These advantages would also apply to the development of a multigenerational community center on the Moseley Land, which abuts Banta-Davis.

The findings and proposals from the feasibility study for a multigenerational community center are described and illustrated in Appendix G. Such a facility would respond to many of the community's needs identified by both the Council on Aging and the Recreation Commission by creating space for community programs for all ages, allowing seniors to congregate and socialize during the day, and supplying teens safe spaces for after-school programs and recreation. Additional efforts to address the needs of Seniors and Teens are highlighted below.

Many other public and privately run opportunities exist for residents to play outdoor sports, some in neighboring communities. Many Carlisle children participate in spring, summer, fall, and winter programs. The activities available for residents of all ages include but are not limited to yoga, Pilates, NIA, Zumba, dancing, cheerleading, karate, boxing, fencing, water aerobics, soccer, basketball, baseball, golf, badminton, beach volleyball, tennis, pickleball, ice hockey and skating, cross-country and downhill skiing, snowboarding, snowshoeing, hiking, rock climbing, gardening, boating, fishing, kayaking, and fishing.

During the summer, the Recreation Commission sponsors swimming lessons at several private pools in town, generously made available for this use by residents. An outdoor swimming pool is included in the Community Center feasibility study; this pool would greatly improve the Summer Fun camp program and open up a host of other programming possibilities for every age group. Year-round, there is a state-of-the-art pool facility located in Concord, the Beede Swim & Fitness Center, which is run by the Concord Recreation Department on a paid membership basis. Seniors over age 65 get a discount of about 25% on membership; those over 80 get a discount of more than 80%.

Seasonally, the Recreation Commission offers a variety of arts, crafts, and exercise programs to children and adults. Also offered is an after-school program with pizza, sports, and arts and crafts for children to enjoy on those Tuesdays when children are released early from the public school.

#### **Augment Recreation Facilities.**

Traditionally, the focus has been on facilities for children, but as the percentage of younger children has decreased and that of those over 65 has increased over the past two decades, facilities that will better serve Carlisle's more diverse population are needed. The Recreation Commission has identified the following needs for additional facilities.

#### **FIELD & FACILITIES NEEDS (THROUGH 2027)**

- Reconfiguring and renovating Spalding Field and adding a multi-purpose artificial turf field
- Building a multi-purpose, multi-generational recreation center with an outdoor pool
- Building additional tennis courts, with lines for pickleball
- Building a fenced-in dog park

#### **Support the New England Mountain Bike Association (NEMBA).**

NEMBA is a recreational organization that advocates responsible trail use and includes as part of its mission “to protect and preserve New England trails and open spaces.” (nemba.org) NEMBA organizes an informal bike patrol to help other trail users at GBFSP and sponsors periodic Trail Maintenance Days in the Boston area including at the State Park.

#### **Support Equestrian Activities.**

The Board of Health listed 125 horses kept in the town in 2019. These animals are kept on private land in Carlisle and make use of the trail network or other facilities available in the community. Foss Farm and GBFSP are home to many of the organized equestrian activities, such as shows and hunter pace events. Many horses are ridden on the extensive town trail network and on public roads as part of daily activities.

#### **OLD NORTH BRIDGE PONY CLUB**

The Old North Bridge Pony Club (ONBPC) is the local chapter of the United States Pony Clubs Inc. (USPC). USPC is a 501(c)(3) organization that develops character, leadership, confidence, and a sense of community in youth through a program that teaches the care of horses and ponies, riding, and mounted sports. It is the foremost national non-profit youth organization for equestrians. ONBPC was founded in 1986 by a group of Carlisle and Concord mothers who wanted to provide a safe environment for their children to enjoy horses and learn about horsemanship. ONBPC was the instigating force, partnering with prospective Eagle Scouts, to resurrect the riding facilities at Foss Farm in the late 1980s.

This year’s members—the majority of whom live in Carlisle with others residing in neighboring towns—range from 6 to 17 years of age. Currently the club is in the middle of the membership renewal process and is expected to start 2021 with 6 to 10 children. The drop off in membership may be due to there being fewer ponies and horses in town than in the past and thus fewer children growing up around them and having access to them.

Before COVID-19 restrictions, ONBPC held weekly meetings that encompassed both a mounted and unmounted horsemanship portion. The majority of these meetings were held at Foss Farm and private farms and homes in Carlisle. Other venues include Great Brook Farm State Park and the Browning ring in Lincoln. In addition to regular meetings, special activities include clinics from nationally and internationally recognized instructors, preparatory clinics, testings to achieve an individual’s next level, team competitions at the regional and national level, camps, hunter pace events, and trail rides on many of the wonderful trails in Carlisle and surrounding towns. Fundraisers to benefit both the educational curriculum and the local public land are also an integral part of the ONBPC program. One of the most important roles of ONBPC is as a steward for Foss Farm, with money from fundraisers used for fencing, signs, mowing, and maintenance of the footing in the rings.

### **Needs for Seniors**

The Complete Streets work in the center, including new and improved pathways along all the roads emanating from the Town Center, makes it easier and safer for seniors (and others) to walk around town. The Town should encourage the further extension of pathways along all the roads emanating from the Town Center and, where feasible, pathways elsewhere in town. The Council on Aging (COA) will continue to promote the “walking group” on town pathways and trails and will work with the Trails Committee to expand the number of trails that are accessible to seniors and people with disabilities. Notices in the COA monthly newsletter, the Carlisle Mosquito, and the local cable TV channel raise seniors’ awareness of open spaces and recreational resources throughout town. A multigenerational community center, currently under consideration, would support seniors by accommodating the myriad of recreational and educational programs offered by the town. The current offerings are extensive, though limited by the need to run them in many different venues—each with its own limitations. Coordinating these activities across multiple venues is also an inefficient use of limited COA staff time.

### **Needs for Teens**

The majority of Carlisle teenagers attend Concord-Carlisle Regional High School, so their organized recreation needs are met mostly outside of Carlisle. Both Middle School and High School students have Community Service requirements that often engage them in conservation projects in Carlisle. These projects sometimes include actual filings with the Conservation Commission, giving students a first-hand experience of government processes and the importance of, for example, wetlands protection. Both the Conservation and Recreation Commissions stay engaged with and coordinate with the local Boy Scout groups; Eagle Scouts work with both Commissions on various projects. Carlisle Middle School students are involved in conservation through the Blanding’s Turtle program, funded by CCF, which includes tracking and monitoring individual turtles and having students raise hatchlings for nine months before releasing them into the wild. CCF volunteers have led Middle school science classes on field trips to vernal pools on the Conant Land, a short walk from the schools; the information they gather is integrated into the science curriculum. The Middle School Art Club has been partnering for the past five years with the Carlisle Trails Committee, painting pictures of flora and fauna that are then mounted on trail intersection markers throughout the trail system. In a further effort to encourage Carlisle children to get out in nature, in 2019, CCF provided a copy of Trails in Carlisle to every Carlisle family with school-age children.

### **Need to Increase Handicap Accessibility**

Carlisle has made improvements in accessibility through the renovation of the school and the redesign of the Town Center rotary and its related crosswalks and pedestrian pathways. Carlisle intends to improve handicap accessibility to some areas of the playing fields, playgrounds, and conservation lands. Although accessibility is not feasible in many areas (e.g. along steep, rocky trails), handicap accessibility to Carlisle’s recreation and conservation lands can be improved in some areas with minimal changes. As indicated in Table 11, Accessibility of Conservation and Recreation Lands in Carlisle, main areas of improvement still needed are signage and parking lot surfaces.

Carlisle has an ADA Task Force consisting of the Town Administrator (and ADA Coordinator), the Fire Chief, the Building Commissioner (and Zoning Enforcement Officer), the Library Director, and a citizen representative. The Task Force has received no complaints from citizens during the past 7 years.

### **Need for Public Education**

The need to educate the public about conservation and promote conservation is ongoing. Education is needed to encourage residents to conserve water and other limited resources, to enhance understanding of Carlisle's biota and ecosystems and the need to protect them, to make lifestyle changes to reduce pollution and limit damage to our shared environment, and to support municipal efforts to reduce the town's carbon footprint. For the past 8 years, as part of its mission to educate the community about conservation, CCF has sponsored nature walks on conservation lands throughout town and talks by naturalists on a variety of topics at the local library. The Susan Zielinski Natural Science Fund at the Gleason Public Library has sponsored or cosponsored presentations and field programs on native animals and other topics. Since 1988, the Conservation Commission has presented a Conservationist of the Year award to a Carlisle resident. Clark Farm works with all grades of the Carlisle Public Schools and other local school groups to teach the next generation about sustainable agriculture and the food system.

Past successes in land preservation can lead to a sense of complacency or a view that Carlisle already has enough protected lands. Community discussions on conservation help galvanize local support, both political and financial, for conservation and protection of additional lands. CCF works behind the scenes to build and maintain contacts with landowners, particularly those with large unprotected parcels, many high on the priority list (Table 7), to educate them about responsible land use and the estate-planning benefits of putting land under CRs or donating land for permanent protection.

The Board of Health has received a Community Health Network Area (CHNA) grant to do a public education campaign on preventing tick-borne illnesses and to develop land management techniques to reduce exposure to ticks. Signs will be placed on public trails to advise the public using recreational lands and trails. The Board has created a Lyme Disease Subcommittee to continue with this work.

### **Need for More, Safer Pedestrian Pathways.**

Pathways were identified in the 2012 *Acton, Concord, and Carlisle Regional Accessibility Plan* as an important asset, particularly for a town in which the population continues to shift toward more senior residents. The Plan was funded by a Community Transformation Grant to the Carlisle Board of Health, in collaboration with Concord and Acton, from MAPC through the Transformation Grant Program of the Centers for Disease Control and Prevention. The study cited evidence that increasing "walkability" in a community leads to healthier residents from increased physical activity and a healthier, more connected community by creating more opportunities for casual and spontaneous interactions. Additionally, as traffic—especially commuter through traffic—continues to increase in Carlisle, providing an alternative for pedestrians to walking along the narrow roads is a greater priority. Increasing pedestrian connections among the town's public lands will make the town more accessible.

Without direct access to public transportation and with limited local commercial enterprises, Carlisle is dependent on automobiles; amenities that reduce reliance on automobiles are beneficial. Making Carlisle more bicycle-friendly—for example with dedicated bicycle lanes—is a laudable but daunting goal due to the typically narrow, winding roads with minimal or no shoulders; the town will need to find ways to make its roads safer for cyclists and thus to realize the long-term benefits of more cyclists (and fewer accidents).

The Pedestrian and Bike Safety (Pathways) Committee was disbanded in 2010 after the completion of the Town Center pathways. In 2013, acknowledging the importance of pathways to the community, the OS&RP included a recommendation that this committee be reconstituted and that new funding sources be identified to continue the work. In 2015, a new committee called Pathways II was appointed by the Select Board to develop a plan to complete small sections of pathways with existing funds, to develop a plan for a more extensive pathway system, and to address maintenance and snow removal.

The only tangible progress since 2013 is the acquisition of pathway snow plowing equipment for the DPW (approved at 2016 Annual Town Meeting). Citizen concerns about safety of several crosswalks linking various pathways led to a postponement in 2018 of pathway expansion plans—completion of a 500-foot section of pathway on the north side of Bedford Road between the library crosswalk and East Street and extension of the existing pathway along Bedford Road from Kimball’s to Stearns Street—to allow for the completion of an engineering assessment of increased pedestrian safety and mobility opportunities in Carlisle.

This led to the Select Board’s decision to take part in the state’s Complete Streets program, which provides funding for local projects that provide safe and accessible options for all travel modes—walking, biking, transit, and vehicles—for people of all ages and abilities. Tier 1 of Complete Streets required the Town to adopt a Complete Streets Policy, which the Select Board did in July 2018, committing to the implementation of Complete Streets principles in all new, maintenance, and reconstruction municipal projects. (See Appendix K.) In addition to safety considerations, the policy states goals of improving the public and environmental health by encouraging walking and bicycling as alternatives to vehicle travel and leveraging the network of roads, pathways, and trails to maximize connectivity among home, work, school, and recreation.

An engineering firm was engaged to develop a Prioritization Plan that was approved by MassDOT. The plan includes 25 potential projects involving redesigning intersections and crosswalks and building new sections of pathways or sidewalks, all incorporating accessibility requirements, along the Town’s five main roads. The Town received a \$250,000 Complete Streets grant in 2019, supplemented by \$50,000 appropriated at 2019 Annual Town Meeting and Chapter 90 funding, to redesign the Carlisle Center rotary to reduce traffic speeds; to create new locations, pavement markings, accessible ramps, and signage for several crosswalks; to reconfigure the Bedford Road/East Street intersection; to build new and improved accessible pathways in the Town Center; and to improve two crosswalks east of the Center along Bedford Road towards Banta-Davis and Kimball’s.

To implement this work, the Select Board combined the Traffic Safety Advisory Committee and Pathways II into a new Traffic and Pedestrian Safety Committee appointed in September 2019.

The committee held public information sessions and engaged an engineering firm to develop bid documents for the state-approved projects. The work was completed during the summer of 2020.

### **Need for Communication and Planning**

Interdepartmental communication among the various land use boards (Conservation Commission, Recreation Commission, Planning Board, Board of Health, and Building Department) remains important, as does communication with other town boards involved in decisions affecting the future of land use in Carlisle (Select Board, Zoning Board of Appeals, and Affordable Housing Trust). In 2017, the Select Board adopted a Land Use Pre-submission Policy requiring a conference, prior to an applicant's submission of a formal permitting application, with the appropriate land use administrators "representing the Board of Health, Conservation, Planning, Zoning/Building, Housing, and Historic." The conference is intended to help clarify issues, concerns, and possible remedies at the earliest stage of the development process.

As land values have increased and the number of parcels in need of protection has decreased (both due to past successes and to the development of lands previously on the priority list), the complexity of the issues related to the remaining unprotected lands in town has also increased. Land conservation cannot be considered in a vacuum. The Master Planning process, currently underway, should help the Town prioritize among the many needs and aspirations of the community and the limited funds available with which to meet or realize them.

Protection of natural resources goes beyond protecting land from development. In fact, as noted above, development models that reduce sprawl and include preservation of open space provide the double benefit of increasing the tax base and protecting open space without municipal investment (with the concomitant tax increase).

### **C. Management Needs, Potential Change of Use**

Management of Town-owned recreation and conservation parcels is the responsibility of the Recreation and Conservation Commissions, respectively. Other conservation lands in town are managed by the state, the federal government, and private entities including the Carlisle Conservation Foundation, Sudbury Valley Trustees, the Trustees of Reservations, and Harvard University.

The Conservation Commission created the volunteer Land Stewardship Committee (LSC) to assist with its management responsibilities. The lack of funding for professional support means the LSC takes on the development of detailed documents such as Baseline Assessments and then follow-up Management Plans. The LSC believes that expanding the number of committee members would allow more sustained effort on property management, including increased frequency of monitoring.

The Select Board (SB) has a long-standing policy regarding the Right of First Refusal regarding Notices of Intent to sell or convert to a residential, commercial, or industrial use a property currently in Chapter 61, 61A, or 61B. This policy requires that landowners give notice to the SB, Board of Assessors, Planning Board, and Conservation Commission and that the SB will solicit within 7 days recommendations from the other boards with regard to possible exercise of the Town's Right of First Refusal. The SB is also encouraged to notify the BOH and the local

land trust (Carlisle Land Trust/CCF). As noted elsewhere in this OS&RP, in 2017 the Town used its right under Chapter 61A to preserve—in coordination with CCF—the Woodward Land. As shown in Table 7: Seven-Year Action Plan Property Protection Priority List, 10 of the 26 properties ranked priority 1 or 2 for protection are in (or partially in) Chapter 61, 61A, or 61B, making well-coordinated Town response to Notices of Intent of removal from Chapter 61 a critical tool in preserving more land.

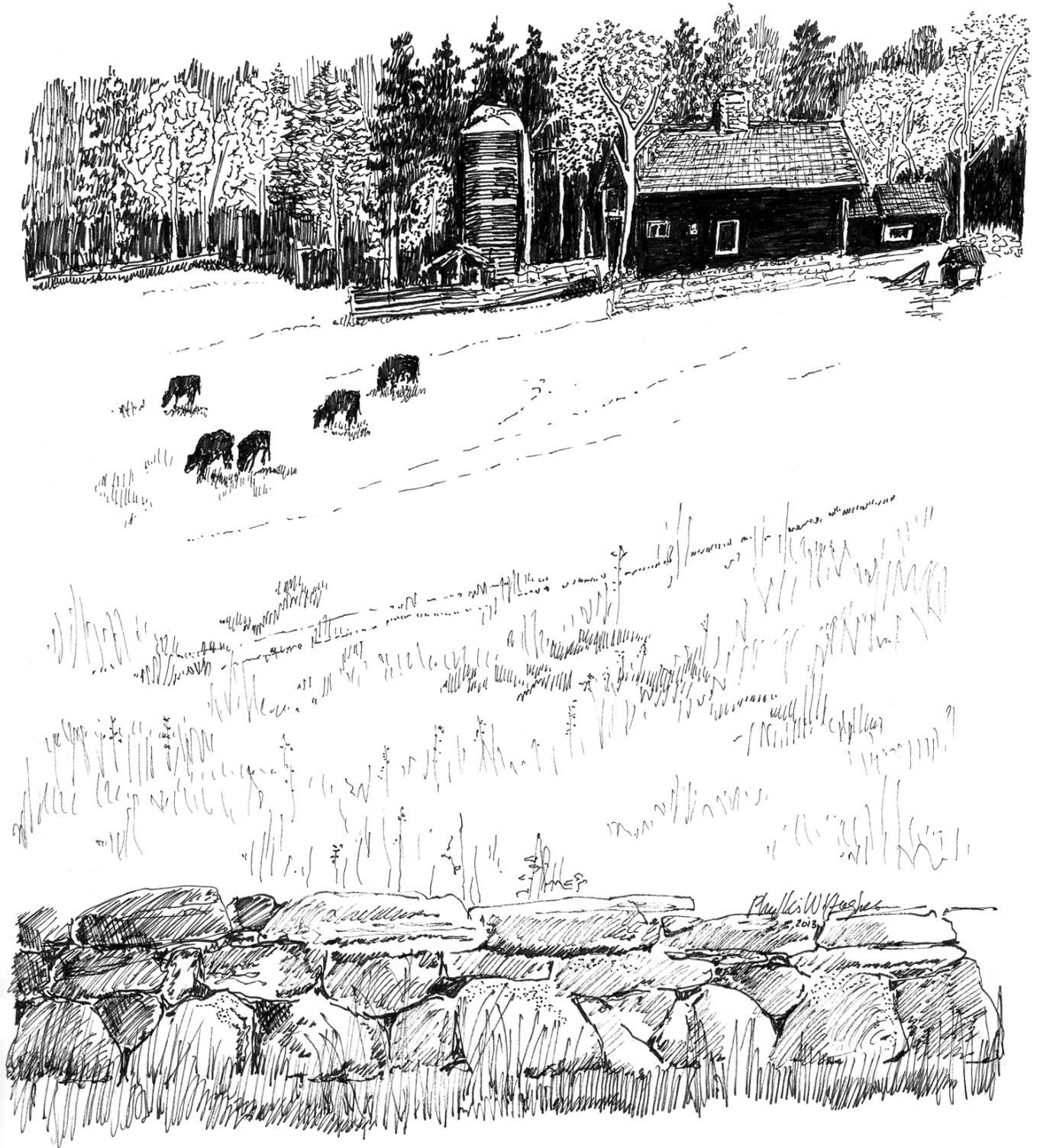
The Recreation Commission is responsible for management of Town recreation facilities including outdoor fields used by the Carlisle Public Schools for gym class and school sports teams. Scheduling field use can be a challenge, especially in spring when wet weather may limit or delay use for spring sports. Overuse of fields has created management issues with regard to turf health and resilience; engaging professional maintenance companies instead of volunteers has resulted in improved quality of playing surfaces. One of the drivers for the Recreation Commission’s interest in artificial turf at a refurbished Spalding Field is that it would allow more uses than a natural turf field and help minimize overuse of natural fields at Banta-Davis.

### **Management Priorities**

- Additional Baseline Assessments and Management Plans, especially for large, significant conservation properties
- Identification of and evaluation of funding sources for special projects such as invasive plant control, the establishment of pollinator gardens, and wildlife habitat assessment
- Joint meetings, to be held at least yearly, of Town boards and committees and private groups with conservation- and recreation-related agendas
- Conservation property maintenance and improvement.
  - New signage, especially for people with disabilities
  - Additional parking near popular trail heads
  - Control of Poison Ivy along trails
  - New wells at Foss Farm community gardens
- Refurbishment of Spalding Field, including possibility of artificial turf
- Creation of a fenced-in dog park to minimize dog waste on playing fields
- Identification of a suitable pond for community ice skating

## Section 8: Goals and Objectives

- A. Goals and Objectives
- B. Available Protection Methods



*Rural vista of the Valentine Farm, part of an expanded western Carlisle corridor of open space preserved in the early 2000s, thanks to a 121-acre Conservation Restriction Jack and Betty Valentine placed on their land to preserve the vistas of fields and farmland surrounding 17 building envelopes that will ensure that any houses built in the future will be hidden in the woods.*

## **Section 8: Goals and Objectives**

In Section 2, the accomplishments of the previous Open Space & Recreation Plan were reviewed. In this section, the community vision from Section 6 and the Town of Carlisle's needs from Section 7 are formulated into a comprehensive set of goals and objectives. Section 9 contains action plans in the form of initiatives by various entities for achieving these goals.

### **A. Goals and Objectives**

Open or natural space is a finite resource that is becoming scarcer as the town develops. The town has realized for some 40 years that it must be proactive in its efforts to guide residential development in a way that supports ongoing efforts to preserve open space. In the current economic climate, Carlisle's leaders are also mindful of the limited financial resources for acquisition of additional municipal land, whether for open space, municipal facilities (including recreation), or Town-supported affordable housing. The ongoing Master Planning effort should assist the community in determining how best to manage the town's assets as a whole to direct growth most effectively for the overall environmental and social health of the town.

Carlisle needs to continue to plan and to preserve open space and enhance opportunities and facilities for recreation to meet the following goals and objectives.

#### **Goal 1 – Maintain the rural character of Carlisle.**

##### **Objectives**

- a. Protect natural features such as open fields, woodlands, wildlife habitat, and scenic vistas.
- b. Protect corridors and trail linkages for wildlife, and provide additional protected connections between existing open spaces.
- c. Encourage agriculture in town.

#### **Goal 2 – Protect the town's environment.**

##### **Objectives**

- a. Protect the town's water resources: the water supply for our individual wells, lands with surface water resources, wetlands, streams, ponds, or potential aquifer sites for a municipal water supply.
- b. Protect natural spaces that provide ecological diversity, and encourage efforts to support native pollinators.
- c. Identify and protect sites with State-listed rare or otherwise protected species.
- d. Proactively manage protected lands, including control of invasives.
- e. Increase energy efficiency and use of renewable energy sources to reduce greenhouse gas emissions.

### **Goal 3 – Meet the town’s recreational needs.**

#### **Objectives**

- a. Upgrade existing recreation areas and facilities.
- b. Provide additional sites for active recreation facilities.
- c. Pursue the development of a multigenerational community center (for recreation, community activities, and senior activities).
- d. Improve signage and accessibility for people with disabilities.
- e. Add trail or pathway linkages between conservation or recreation parcels to enhance the town’s trail system.

### **Goal 4 – Proactively manage land use in town.**

#### **Objectives**

- a. Continue to document existing open space with baseline assessments, and develop (and carry out) management plans to maintain or enhance the inherent value of the open space.
- b. Guide where and how concentrated development occurs, and promote development models that preserve open space.
- c. Encourage cooperation among diverse stakeholders involved in efforts to acquire land for municipal use and the preservation of open space.

## **B. Available Protection Methods**

To meet the goals and objectives related to land acquisition listed above, understanding the protection methods available to the town is necessary. Open space can be protected in several ways. Direct acquisition is usually the best method to preserve the conservation and recreation values of a piece of land. However, other ways also exist to protect open space.

**Commonwealth and Federal Funding** has helped Carlisle immensely in acquiring several conservation lands, such as Foss Farm, the Towle Land, the Greenough Land, and the Davis Corridor. Great Brook Farm State Park and Great Meadows National Wildlife Refuge (GMNWR) preserve large areas of important natural space in town.

The state Local Acquisitions for Natural Diversity (LAND) Program (formerly the Self-Help Program) was established to assist municipal conservation commissions in acquiring land for purposes of natural resource and passive outdoor recreation. In 2012, Carlisle was unsuccessful in its application for a LAND grant towards the acquisition of the CR on the Elliott Preserve.

The State Conservation Partnership Grant program provides funding to non-profit entities for the acquisition of conservation land. In 2016, the Sudbury Valley Trustees (SVT) and Carlisle Conservation Foundation (CCF) received an \$85,000 grant towards the acquisition of the Woodhaven Farm CR, which covered extensive woodlands and wetlands abutting the Davis Corridor and the Estabrook Woods. Another Conservation Partnership Grant was sought in the next grant cycle—to defray the cost of the CR on the Sorli South fields—but it was not

awarded, perhaps because, for this type of grant, wildlife and conservation are valued more highly than farming.

**Adoption of the Community Preservation Act (CPA)** in 2001 was an important step in protecting open space. CPA funds may be used for open space (both conservation and recreation), historic preservation, and community housing. The town's citizens elected to levy a 2% surcharge (the state allows up to 3%) on real estate taxes, excluding the first \$100,000 in assessed value. A minimum of 10% of CPA funds must be used for each of the three purposes noted above, but the allocation of the rest of the funds is up to Carlisle's citizens. The state matched the surcharge dollar for dollar for the first six years; even with subsequent reductions, the state has provided an average match of more than 46% since inception, providing more than \$3 million in state CPA funding to Carlisle. Carlisle's citizens reaffirmed their support for the real estate tax surcharge by soundly defeating a Warrant Article to rescind the CPA at a Special Town Meeting in 2011 and an Article to reduce the surcharge to 1% at 2017 Annual Town Meeting.

A Community Preservation Committee (CPC), consisting of seven members, one each from the Conservation Commission, Historical Commission, Planning Board, Recreation Commission, Housing Trust, Select Board, and one member from the community at large, can recommend expenditures of CPA funds, but funds can only be appropriated by Town Meeting.

**Permanent Conservation Restrictions (CRs) on Private Lands** allow the land to remain in private ownership while limiting or preventing future development. This tool is especially useful for preserving wildlife corridors and linking trails, although CRs may prohibit public access to the land. CRs protect conservation values such as vista, habitat for endangered species, and ecological diversity, but they do not necessarily provide the public with sites for active or passive recreation.

**Permanent CRs on Town Conservation Lands** create permanent protection against proposals to change the use of these lands.

**Agricultural Preservation Grants** were once seen by town planners as a useful tool to help preserve farmland in Carlisle, but for the most part they have not been successful. Carlisle farms do not compare in size or productivity with those in less developed, more fertile parts of the Commonwealth. However, in 1999, Carlisle was fortunate to receive state Agricultural Preservation Restriction (APR) aid, which helped finance the purchase of the Wang-Coombs farmland. Over the past several years, local residents have filled some of the gap in government financing by initiating farm preservation on their own, buying properties (some protected by CRs) from retiring long-time farming families, renovating historic barns, and leasing the land to new farm families to help keep active farming in town.

**The local Open Space Land Development Trust**, called the Carlisle Land Trust (CLT), was formed as a private entity in 1981 by CCF. In 1982, the Trust developed Bates Farm, and in 1986, the Trust also developed some of Clark Farm, in each case preserving large areas for conservation.

CCF, sometimes partnering with The Trustees of Reservations (TTOR) or the Sudbury Valley Trustees (SVT) and often coordinating with the Town, has been involved in the protection of the

extensive Estabrook Woods buffer lands, the Wang-Coombs land, the Benfield property, the Elliott Concord River Preserve, Woodhaven Farm, the Sorli south fields, and the Woodward Land, among many others.

**Zoning that encourages protection of natural space** through cluster development can preserve open space without the Town needing to purchase the land. In the almost 40 years since the initial adoption of cluster zoning, the Town has protected more than 200 acres of natural space in thirteen cluster developments (Table 8).

**Charitable Donations** can be prompted by the desire to reduce property taxes, income taxes, and future estate taxes, as well as to prevent unwanted development or to preserve traditional or historical land uses. Landowners donate land or CRs on their property to qualifying organizations such as the Town of Carlisle, the Carlisle Conservation Foundation, The Trustees of Reservations, or the New England Forestry Foundation, which typically help pay for the costs of surveys, land planning, and legal work needed to effect the donation.

**Grants from Private Foundations** have helped supplement charitable gifts towards the acquisition of property or CRs. CCF and SVT received grants from the Bafflin Foundation and the Fields Pond Foundation toward the purchase of the CR on Woodhaven Farm.

## Section 9: Seven-Year Action Plan

- A. Introduction
- B. Agricultural Commission Initiatives for 2020 through 2027
- C. Board of Assessors Initiatives for 2020 through 2027
- D. Board of Health Initiatives for 2020 through 2027
- E. Carlisle Conservation Foundation (CCF) Initiatives for 2020 through 2027
- F. Carlisle Public Schools Initiatives for 2020 through 2027
- G. Conservation Commission Initiatives for 2020 through 2027
- H. Conservation Restriction Advisory Committee Initiatives for 2020 through 2027
- I. Council on Aging Initiatives for 2020 through 2027
- J. Deer Control Committee Initiatives for 2020 through 2027
- K. Finance Committee Initiatives for 2020 through 2027
- L. Historical Commission Initiatives for 2020 through 2027
- M. Housing Trust Initiatives for 2020 through 2027
- N. Land Stewardship Committee Initiatives for 2020 through 2027
- O. Planning Board Initiatives for 2020 through 2027
- P. Recreation Commission Initiatives for 2020 through 2027
- Q. Select Board Initiatives for 2020 through 2027
- R. Sudbury Valley Trustees Initiatives for 2020 through 2027
- S. Traffic & Pedestrian Safety Committee Initiatives for 2020 through 2027
- T. Trails Committee Initiatives for 2020 through 2027
- U. Youth Commission Initiatives for 2020 through 2027



## Section 9: Seven-Year Action Plan

### A. Introduction

The residents of Carlisle treasure the town's open spaces for active and passive recreation, for the protection of wildlife, and for the maintenance of the town's rural character and natural resources. To continue to increase the inventory of protected open spaces and rural vistas, the Town must actively pursue strategies that will ensure that some of the remaining undeveloped parcels are acquired or protected in some way (such as by conservation restrictions (CRs)). The current Open Space and Recreation Plan (OS&RP) Committee recommends that the Town attempt to provide more protected corridors between protected parcels to benefit wildlife and to connect sections of public trails. The Town must look at all the means available to preserve and protect its natural spaces and to plan for and fund its management of conservation and recreation lands.

The Committee also recommends that the Town plan for additional active recreation needs and the development of a dedicated space for some combination of Community Center, Senior Center, and Recreation Center.

As part of the community process of determining Carlisle's goals and an analysis of the town's needs, the OS&RP Committee asked each relevant Town board or committee or non-profit organization first to review its progress on initiatives listed in the 2013 OS&RP (if it participated in that plan) and then to list specific initiatives it intends to pursue over the next seven years. These follow, arranged alphabetically by entity, in subsections B through U of this section. High-priority initiatives selected by the OS&RP Committee from the various lists of initiatives, with dates for completion and responsible parties, are included in the table on the next page. (See also Map 8: Seven-Year Action Plan.)

Many of the initiatives listed below are ongoing and require little if any additional funding beyond existing Town department budgets. Others, such as development of new playing fields and other active recreation facilities, require significant planning and substantial funding that would require approval at Town Meeting. There are several funding methods for initiatives in Carlisle, each of which receives careful vetting through an annual process.

- If an initiative is expected to be recurring and requires annual funding, it is included within regular department budgets.
- If an initiative is considered a non-recurring expenditure, it is presented as a Warrant Article at Town Meeting for direct appropriation or as part of a long-term financing plan.
- If an initiative meets Community Preservation Act (CPA) requirements, a request to fund it is submitted to the Community Preservation Committee (CPC) and, if approved, to Town Meeting. Recreation and Open Space are among the acceptable uses for CPA funds.

When an identified priority parcel becomes available, land acquisition is considered. Historically, land acquisitions have been complex, requiring coordination among many Town boards and commissions as well as private organizations such as the Carlisle Conservation Foundation (CCF). State Local Acquisition for Natural Diversity (LAND) grants and grants from other public or private entities may be sought for conservation purposes to supplement Town Meeting appropriations or CPA funding.

<b>High-Priority Initiatives, Timetable, Funding Source, and Responsible Parties</b>			
<b>INITIATIVE</b>	<b>YEAR</b>	<b>FUNDING SOURCE</b>	<b>RESPONSIBLE PARTY</b>
<b>Recreation Needs</b>			
<i>Banta-Davis: Build a fenced dog park</i>	2021	CPA, DB, G	RecCom
<i>Moseley Land: Build multi-purpose community center</i>	2025+	TBD	RecCom, COA
<i>Spalding Field: Reconfigure &amp; renovate, add turf field</i>	2022	TBD	RecCom
<i>Locations TBD: Add tennis courts, skating pond</i>	2022	CPA,TBD	RecCom
<b>Improve Accessibility</b>			
<i>Town: Improve communication w/disabled community</i>	2021+	N/A	SB, TA
<i>Town: Improve walkability and pedestrian safety</i>	2020+	TBD	SB, TPSC
<i>Cranberry Bog: Make paths accessible to OPDMDs</i>	2021+	CPA	ConsCom
<b>Invasive Plant Control and Edge Reclamation</b>			
<i>Foss Farm: Maintain clearing of field and field edges</i>	2020+	DB, G	ConsCom, Trails, PC
<i>Towle/Benfield/Bisbee: Control Buckthorn &amp; Poison Ivy</i>	2020+	DB, G	ConsCom
<b>Water Resources &amp; Agriculture</b>			
<i>Cranberry Bog: Determine use &amp; preserve open space</i>	2021+	TBD	SB, ConsCom
<i>Encourage diversified agricultural use of Town parcels</i>	2021+	N/A	AC, ConsCom
<i>Promote responsible woodland management</i>	2021+	N/A	AC, ConsCom
<b>Diversity of Wildlife</b>			
<i>Explore ways to encourage native pollinators</i>	2021+	TBD	ConsCom, CCF
<i>Maintain updated inventory of biodiversity in Carlisle</i>	2021+	N/A	Vols, ConsCom
<b>Land Protection &amp; Property Maintenance</b>			
<i>Benfield Cons. Land: Coordinate field maintenance</i>	2020+	TBD	ConsCom, CHT
<i>Greenough Barn: Develop management or removal plan</i>	2021+	TBD	SB
<i>Town Common: Develop ongoing maintenance plan</i>	2021+	N/A	HistCom
<i>Raibert property: Seek protection and trail connection</i>	2020+	N/A	Trails
<i>Central Burying Ground: Restore &amp; maintain</i>	2021	CPA	HistCom
<i>Greenough Dam: Repair or remove dam</i>	2021	G/CPA	ConsCom
<i>Do more Baseline Assessments &amp; Management Plans</i>	2021+	N/A	LSC
<b>Trails and Connections</b>			
<i>West: Connections to Rail Trail and Sorli Farm</i>	2021+	CPA	Trails, CCF
<i>Benfield and Spencer Brook lands: More connections</i>	2021+	CPA	Trails, CCF
<i>South: Estabrook and Russell Cons. Land connections</i>	2021+	CPA	Trails, CCF
<i>Center: Expand pathway &amp; trail connections</i>	2021+	CPA	Trails, TPSC
<i>East: Davis Corridor to GMNWR &amp; Foss; Woodward</i>	2021+	CPA	Trails, CCF
<i>NE: East St pathway; Rangeway, Mannis, Town Forest</i>	2021+	CPA	Trails, CCF
AC = Agricultural Commission; CCF = Carlisle Conservation Foundation; CHT = Carlisle Housing Trust; COA = Council on Aging; ConsCom = Conservation Commission; CPA = Community Preservation Act Funding; DB = Departmental Budget; G = Grant(s); HistCom = Historical Commission; LSC = Land Stewardship Committee; N/A = Not Applicable (no funding need currently anticipated; work expected to be done by Town staff, committees, or volunteers); OPDMD = Other Power-Driven Mobility Device; PC = Pony Club; RecCom = Recreation Commission; SB = Select Board; TA = Town Administrator; TBD (To Be Determined following planning; may or may not require funding from CPA or other sources, plus possible legal expense in some cases); TPSC = Traffic & Pedestrian Safety Committee; Trails = Carlisle Trails Committee; Vols = Local volunteers			

Input from most of the following entities was received in February and March 2020, as the COVID-19 pandemic was beginning to limit public and private gatherings. A few later submissions were received in late spring and the summer. Due to pandemic-related stresses on Town employees and volunteers, the OS&RP Committee has not sought updates to the earlier submissions.

## **B. Agricultural Commission Initiatives for 2020 through 2027**

Maintaining and protecting open space is an important goal for the town, and keeping existing agricultural land in active agriculture is an important part of this goal. The town needs to encourage responsible and sustainable land use in order to encourage local production of agricultural products. Towards that end, the Agricultural Commission supports an increase in diverse agricultural practices on open space parcels, both those currently in agricultural use and those that once were (which includes most open space parcels) but are no longer. Especially on land not useful for other forms of agriculture, and especially when environmental sensitivities like run-off and erosion are an issue, pasture usage such as livestock grazing should be actively encouraged and integrated with parcels' other uses.

In general, *conservation*, *recreation*, and *agriculture* can all happily coexist, for they can support each other. They all have the same goal, namely the continued health of the community and of the land on which our health ultimately depends. Yet of these three categories of use, agriculture seems to be undervalued. So emphasis must be placed on supporting existing agriculture and on encouraging new agricultural endeavors.

Trees are one of this region's most important natural resources, and from an agricultural perspective, one of its most important crops. Therefore sustainable and responsible woodland management should be a priority for the town. Effort needs to be spent on educating property owners on the benefits of proper woodland management, especially when integrated with a holistic conservation plan. Trees also have a very important role to play in slowing global warming since they excel at carbon sequestration.

From a conservation point of view, it should be noted that farmers are in effect a "critically endangered species" in New England as a whole and in Middlesex County in particular. As such, they need our protection and support. New crops of farmers need to be educated and nurtured. The economic forces threatening their survival need to be abated. Many different individuals, boards, and groups within the town need to be aware of the roles they can play in making these things happen. The Agricultural Commission will assist in whatever way possible to retain active agriculture in Carlisle.

In general, the Agricultural Commission has a goal of supporting active agriculture, wherever possible and appropriate, on public and on private lands. Agriculture, in its fullest sense, contributes not only to Carlisle's rural character, but also to maintaining open vistas, sequestering carbon, creating foods and other products, and providing jobs and other economic opportunities. It is also a deep part of our history as a town. Specific goals include the following.

### **1. Education and Outreach**

Organize and sponsor educational and community events, such as school events, talks and lectures, workshops, film screenings, farm tours, potluck suppers featuring locally grown ingredients (e.g., Taste of Carlisle), and more. The goal is to encourage and foster active engagement with the land by more residents.

### **2. Advocate for Diversified Agricultural Use of Town Parcels**

Agriculture, both commercial and residential, needs to be retained and/or re-incorporated on more town parcels. Woodland management programs will be investigated. The Agricultural Commission will communicate the benefits of such uses to our residents.

### **3. Mediate on Agricultural Issues in Town**

Provide input and foster cohesion among town boards and commissions on issues involving agriculture in order to support townspeople and entities engaged in farming. Mediate on any agriculture-related disputes that arise in town.

### **4. Expand Economic Opportunities for Agriculture**

Network with other organizations in town and elsewhere to foster opportunities for the sale of agricultural products. Facilitate the purchase and use of locally produced food by local businesses, schools, churches, group homes, gatherings and events, Meals on Wheels, Old Home Days, and others.

### **5. Explore Farm Diversification to Foster Economic Viability**

Diversified means of production and value-added products have been shown to increase the viability of small farms. For example, the use of commercially or municipally owned certified kitchens to prepare locally grown foods for sale to the public can increase farm income. AgCom can facilitate these relationships.

### **6. Research Grant Opportunities**

Pursue research grant opportunities for soil testing and other agricultural assessments. Sponsor and promote testing of agricultural lands and currently non-agricultural Town-owned parcels.

## **C. Board of Assessors Initiatives for 2020 through 2027**

Continue to coordinate with the Planning Board and Conservation Commission on the annual updates of the Town Assessors' maps to include mutually beneficial updates to GIS data layers for parcel ownership, common drives, conservation restrictions, and pedestrian easements, among others. Assist with the provision of Town Assessors' GIS data layers for Town planning initiatives.

## **D. Board of Health Initiatives for 2020 through 2027**

Protection of ground water remains a primary goal for the Board of Health since the Town continues to be 100% dependent on private wells and septic systems. Because of the interconnectedness of the underground water supply, overuse or pollution of water in one location may adversely impact residents in a completely different location.

## **Current Activities**

The Board is pleased to report that many of the initiatives identified in the previous OS&RP have been successfully implemented.

In 2008, the Board revised its Supplementary Sewage Disposal Regulations to better address design flow requirements so that systems are not unduly oversized with a garbage grinder allowance. Garbage grinder allowances are still required for smaller systems (330 GPD (gallons per day)) but larger systems (440 GPD) follow a design flow table that is more reflective of actual usage. In 2019, additional plan requirements were added and cumulative project flows were addressed.

The Board also standardized its criteria for granting waivers for distances to wetlands and revised its design and construction standards for systems greater than 2000 GPD. Currently, more than 50% of septic designs submitted are alternative technology systems. These systems provide additional treatment area with less disturbance of the landscape.

In 2016 the BOH adopted an Irrigation Policy for withdrawals based on land area for new and upgraded irrigation systems. This policy allows usage of 15% of the estimated average recharge (water replenishment for the property) for irrigation. This is designed to ensure that an adequate supply of clean, drinkable water will remain available, allowing for residential use, evaporation, transpiration, and runoff. This policy applies to all new or modified irrigation systems in the town of Carlisle. This Irrigation Policy is one of multiple controls implemented by the BOH to ensure that all residents will have a sustainable supply of drinking water of adequate quality and volume.

The Board strengthened its annual inspection of barns to include evaluating manure-management activities in order to prevent health nuisances and protect nearby wetlands and wells.

The Board continues with its bi-annual well testing program. The collection of this data is helping to build an overall picture of the water quality in town. Future efforts may include adding this information as a GIS layer along with well construction information available under the state's new well driller reporting requirements.

Beavers and beaver-caused flooding continue to be problematic. The Board has issued beaver-removal permits to alleviate flooding of nearby homes, septic systems, and/or wells.

The state modified its guidelines for open and closed loop wells in 2010 and the Board established a local permitting process for geothermal wells that includes design guidelines and requirements for local certification. As of 2020, geothermal wells had been installed on 22 properties. In 2019 the Board of Health banned open loop geothermal wells to protect groundwater quality. An open loop well serves as a supply well for a Ground Source Heat Pump (GSHP) by withdrawing groundwater and discharging it back to an aquifer. Open loop wells introduce the potential for damaging an aquifer because there is no separation between process water and contaminants that may be introduced during operation, repair or maintenance of the GSHP. An open source well may result in transference of contaminants from one water source to another as compared to a closed loop system that utilizes a single source.

In 2011, the Board applied for a State Revolving Fund Loan with a proposal to tie the Library and nearby municipal facilities into the school's wastewater treatment plant. The plant would benefit from regular daily flows, and the Library system is old and may need replacing. Although the proposal was not funded, the Board intends to reapply.

The Board closed out its Community Septic Loan Program funded through the State Revolving Fund due to a change in the state's requirements for participation, which resulted in additional cost to the town. The Board works closely with homeowners facing financial difficulty in upgrading a failed septic system to make the process as smooth as possible.

### **Future Planning**

The Board continues to focus on improving the health of Carlisle residents through healthy behaviors. Promotion of physical activity is one of the behaviors targeted in the Center for Disease Control and Prevention's Healthy People 2020 Goals, which the Board supports.

In Carlisle, the groundwater withdrawn is eventually returned to the same area. In a large municipal system, the water withdrawn travels far away from the original source and, therefore, can be difficult to replenish. Having this local control is an advantage and one of the reasons that the Board of Health makes groundwater protection—both quality and quantity—one of its most important goals. At some point, however, the Town may need to secure a public water supply for its citizens. The Board is looking into how to address the potential for a future municipal water supply should the need arise. The Board has re-established its Water Quality Subcommittee to explore this issue. There is no immediate reason to do so now, but planning for the future is important. The Town should be prepared to identify and purchase land suitable for this purpose.

The Board continues to take other protective measures such as organizing a drug take-back program to reduce medications leaching into the water table. A sharps collection is offered in conjunction with the annual hazardous waste collection day in the spring.

### **Recreational Land Use – current**

The Board has received a Community Health Network Area (CHNA) grant to do a public education campaign on preventing tick-borne illnesses and to develop land management techniques to reduce exposure. Signs will be placed on public trails to advise the public using recreational lands and trails. The Board has created a Lyme Disease Subcommittee to continue with this work.

The Board has also received a CDC Community Transformation Grant to provide recommendations on how to improve accessibility on Town lands and trails. In 2019, the Board closed municipal athletic fields from dusk to dawn due to the prevalence of Eastern Equine Encephalitis (EEE) in the area. Carlisle was identified as Moderate Risk and some nearby communities were labeled High Risk. Increases in EEE cases typically run in three-year cycles. The Board continues to explore the need for joining a Mosquito Control Program due to health risks associated with EEE and West Nile Virus.

In 2019 the Board of Health received a CHNA Planning Grant to conduct a Community Health Assessment. The Assessment included a Community Health Survey and four focus groups, followed in 2020 by an Implementation Grant to address areas of need impacting quality of life

in Carlisle. A pilot program was established for a community health nurse, a consultant was hired to prepare a conceptual study for a Community Center, and public and private Transportation Options were explored. Future plans include adding a Public Health Nurse to the Town's Personnel System, public engagement and fundraising for a Community Center, and accessing transportation networks already in existence in the region.

### **E. Carlisle Conservation Foundation (CCF) Initiatives for 2020 through 2027**

CCF is a non-profit, volunteer organization dedicated to maintaining the rural character of Carlisle and preserving its natural beauty and wildlife habitat. Working with private landowners, public entities, and other local and regional land conservation organizations, CCF serves as a resource and catalyst for land conservation, responsible land use, and community education about conservation.

CCF is often confused with the Conservation Commission and other Town land-use committees. Although CCF coordinates with many of the Town entities, it is not part of Town government. It is an independent, 501(c)(3) public charity that was established in 1960 and is governed by a volunteer (currently 16-member) Board of Directors.

Included in CCF's Goals and initiatives for the next seven years are the following.

#### **Land Preservation**

- Conduct an annual review of CCF's priority list of unprotected private lands and develop and update strategies for working with individual landowners, Town committees, and other conservation groups to protect open spaces.
- Pursue opportunities to preserve open vistas, protect wildlife corridors and habitat, and acquire critical trail connections.
- Place permanent conservation restrictions (CRs) on CCF properties, where appropriate.
- Advocate for Town measures favoring open space protection.
- Use community outreach to encourage placing of CRs on private lands.
- Educate landowners about activities they can do on their own land to support conservation and nature, such as the establishment of pollinator gardens and the use of native plant species in landscaping.

#### **Land Management and Stewardship**

- Monitor land on which CCF holds CRs and enforce terms of CR agreements.
- Update or develop land management plans for all CCF-owned properties.
- Address high-priority needs for CCF-owned property maintenance and enhancement, including boundary markers, signage, parking, trail access.
- Work to remove invasive species from CCF-owned land and encourage native plants.
- Coordinate with other conservation groups and engage conservation professionals for management projects related to forest health, wildlife protection and management, pollinator support, etc.

#### **Community Engagement and Education**

- Increase community awareness of CCF and its activities.
- Sponsor educational experiences focused on nature and conservation land in Carlisle.
- Encourage residents to access and utilize Carlisle's conservation lands.

- Coordinate with other Town conservation groups about goals and collaboration.
- Enhance the CCF website to serve as a community conservation resource, and utilize the *Carlisle Mosquito*, Instagram, and other digital social media to provide information about CCF, conservation, and nature in Carlisle.
- Continue fundraising through annual appeal and for special conservation projects, to rebuild financial resources that will be available for future conservation opportunities.
- Build awareness of planned giving opportunities that can support CCF and conservation efforts, including promoting the Spencer Brook Legacy Society, for donors who include CCF in their estate plans in some way.

## **F. Carlisle Public Schools Initiatives for 2020 through 2027**

The Carlisle School Committee (CSC) greatly appreciates the efforts of the Open Space and Recreation Plan (OS&RP) Committee in updating the town’s Seven-Year Action Plan. The Committee also appreciates being asked for its input on both the progress on previously identified initiatives and the development of the next plan. The School Committee has no initiatives on the 2013 plan for which it was responsible and, therefore, has no update to share at this time.

The CSC has a significant interest in the previous plan’s initiative on Recreational Needs and appreciates of the efforts put forth by the town to complete the boardwalk from Spalding Field to Banta-Davis. The CSC is also interested in the outcome of the evaluation conducted by the Recreation Commission on whether or not more recreation fields are needed at Banta-Davis.

We are fortunate to have access to the wide variety of open spaces available to our school community here in Carlisle. There are a number of spaces on the school grounds that are considered “open” and “recreational” spaces ,which are enjoyed by both our students during the school day and by the entire community at other times. These spaces include the Plaza Playground, the Castle Playground, Spalding Field, and Banta-Davis. The following is a brief description of each, as well as a current description of our plans for possible use and improvement in the near future. It is worth noting that, this year, our school community is engaged in the process of developing a shared vision for the future of learning in Carlisle, and access and use of the extensive open space in our community for scientific and outdoor exploration has developed as one of the key themes running through this work.

**Plaza Playground:** The Plaza Playground is used by a span of students during the school day for recess and classroom activities. The Plaza is also widely utilized by the community after school hours. As we look towards the future of the Plaza Playground, there is a desire to create a softer, greener area on the Plaza to support the safe use of the space.

**Castle Playground:** The Castle playground is utilized by younger students before, during, and after school. The Castle is also widely used by families throughout the week and over the weekend. The Castle was initially constructed in 1988 and is in need of repair, to the extent that it might make sense to plan for replacement in the near future.

**Spalding Field:** Spalding Field is used for a variety of school activities including Gym classes and Field Days, along with our interscholastic sports programs such as Softball, Baseball, and Field Hockey. In recent years the field has fallen into disrepair as significant sink holes have

created safety concerns for those using the fields for all purposes. The Recreation Department is initiating a study of Spalding Field to see what would need to be done in order for it to be renovated to a state that it could once again be safely used for the purposes identified. It is our hope that Spalding Field renovation would be a priority initiative for the OS&RP.

**Banta-Davis:** Banta-Davis is currently utilized by our school community for a number of purposes. Most recently, we have relocated our Softball practices and competitions to Banta-Davis as a result of the deteriorating conditions at Spalding Field. Banta-Davis also provides opportunities for our Cross-Country Team training as well as a variety of other activities engaged in by our students and the entire community. Additionally, a parcel of Banta-Davis is set aside for future construction of a new school in Carlisle, if and when the need arises. The school department would like to continue to use the Banta-Davis land as it has in the past with no additional needs being identified at this time.

In addition to the open space that falls under the purview of the CSC, the students of the Carlisle Schools also utilize other open spaces in town including the Conant Land, Clark Farm, and Great Brook Farm State Park. Our entire school community benefits from the extensive open space in Carlisle, and we appreciate the ongoing efforts of the OS&RP Committee to continue to plan appropriately for the future.

## **G. Conservation Commission Initiatives for 2020 through 2027**

(Organized into four sections of Administrative Tasks, Outreach, Land Management, and Land Protection)

### **Administrative Tasks**

*Promote Effective Financial Management.*

- Continue to support the Community Preservation Act (CPA) and seek the state's matching funds that may be available to support the buying of land for preservation with locally raised CPA funds.
- Coordinate with the CPA Committee to provide information on land acquisitions for protecting open space and water resources.
- Establish a maintenance fund for conservation land to be used for purposes such as mowing, field-edge maintenance, tree or shrub removal, bird nest boxes, invasive species control, and wildlife or plant inventories.
- Coordinate closely with Carlisle's Finance Committee so that both short- and long-term funding needs are clearly presented.
- Continue to budget for sending Conservation Commissioners and staff to trainings and conferences (e.g., Massachusetts Association of Conservation Commissions, Massachusetts Land Trust Coalition) to keep apprised of new developments, best practices, and education.
- Monitor the fee schedule, successfully revised in 2020, to ensure that fees continue to be appropriate relative to administrative time and cost. A five-year schedule is suggested.
- Budget and plan in advance for the timely, high-quality update of the OS&RP every seven years.

*Review and update local wetland bylaw and policies.*

Possible update areas follow.

- No-disturb or no-build zones within a stipulated distance of wetlands.
- Review and update the Carlisle Standard Orders of Conditions.
- Wetland replication standards that would consider ecological factors and wildlife and that would be more stringent than the present state regulations.
- Include “federal wetlands” or large Isolated Land Subject to Flooding as town wetlands in order to protect vernal pools.
- Define and enact standard enforcement procedures.
- Simplify procedures for invasive species control and removal of up to three trees.
- Include procedures to allow for flexibility needed due to global warming, particularly for Bordering Land Subject to Flooding.

*Propose changes to Town bylaws and regulations that could result in additional wetlands protection.*

*Ensure the timely submission of an updated OS&RP.*

*Support and encourage the development of a Town Geographic Information System (GIS) accessible to Carlisle boards, committees, staff, and residents.*

## **Outreach**

*Provide Education and Activities.*

- Support the Conservation Restriction Advisory Committee (CRAC) in its efforts to educate the public about conservation restrictions (CRs), their benefits, and how they are drafted. Willing landowners may step forward once CRs are demystified. Encourage permanent restrictions.
- Support schools, scouting, 4H, and other youth programs involving conservation, ecology, and agriculture.
- Provide lectures, information sessions, and press releases on educational topics, such as vernal pools, local conservation lands, local agricultural ventures, historical resources, Native American resources, and invasive species.
- Continue to support and encourage a vernal pool walk annually in the spring.
- Work with the Recreation Commission to develop a variety of recreational and educational programs for conservation lands that would meet the interests of many residents and which would be consistent with conservation values.
- Support individuals and groups using conservation land for various purposes (e.g., camping, bird walks, search-rescue dog training, dog sledding, artistic endeavors).
- Continue to encourage and support the monthly Conservation Coffee.
- Continue to support the Federal Riverfest celebration and local, state, or federal biodiversity efforts.
- Provide programs and other structured opportunities for wildlife professionals to educate how wildlife can affect public safety.
- Develop and maintain a list of volunteer tasks and opportunities.

*Facilitate communication and coordination of activities.*

- Continue coordination with Chelmsford Conservation Commission and other entities and individuals regarding land and water use in the Cranberry Bog Conservation Land.
- Continue to provide a representative for and help coordinate the Chelmsford-Carlisle Cranberry Bog Coordination Committee.
- Provide a complimentary copy of the OS&RP to Conservation Commissions in abutting towns.
- Continue ongoing dialogue with private organizations, such as Carlisle Conservation Foundation, Harvard University, New England Forestry Foundation, Sudbury Valley Trustees, and The Trustees of Reservations.
- Continue ongoing dialogues with State and Federal agencies that own land in Carlisle, such as the Department of Conservation and Recreation and the U. S. Fish and Wildlife Service.
- Work effectively with other Town committees such as the Select Board, Planning Board, Board of Health, Recreation Commission, Housing Trust, and Finance Committee.
- Work with the Recreation Commission to develop active and passive recreation programs for residents who do not participate in competitive team sports.
- Work with the Planning Board to propose revisions to the Zoning Bylaws to require a minimum percentage of upland area within a lot's dwelling building envelope.
- Work with the Select Board and Police Department to develop a long-term solution for vandalism, safety, and preservation issues at the Greenough Land and the Greenough Barn.
- Continue to review and ensure as much as possible accessibility of conservation lands and trails by Other Power-Driven Mobility Devices (OPDMD).
- Provide a representative or observer on conservation-related boards and committees:
  - Community Preservation Act Committee (active member)
  - Conservation Restriction Advisory Committee (active member)
  - Land Stewardship Committee (active member)
  - Planning Board (occasional observer for special projects that involve land development)
  - Open Space and Recreation Committee (active member)
  - Trails Committee (occasional observer)
  - Wild and Scenic Rivers Committee (SuAsCo Stewardship Council) (occasional observer)
  - SuAsCo CISMA (Cooperative Invasive Species Management Area)
  - Town Advisory Group (when active)
  - Master Plan Steering Committee
  - Committee formed for the Municipal Vulnerability Preparedness grant for Carlisle to address the effects of climate change

**Land Management**

*Promote Conservation and Land Management.*

- Continue to prepare, review, and update Management Plans for each parcel of conservation land and for each parcel of Town land under Conservation Commission management.
- Make a calendar of yearly maintenance and inspection tasks. This calendar should include

items such as brush cutting; field mowing; restrictions on field mowing to respect bird nesting and other wildlife interests; inspection of fences, nest boxes, and signage; inspection of paths and parking areas; inspection of field conditions; monitoring of invasive species; confirming property line integrity and possible need for property line surveys.

- Review conservation lands for invasive plants and develop a strategy for their control, especially within environmentally sensitive areas. Continue the work begun, but not yet completed, to control invasive plants on the Foss Farm Conservation Land and to control Poison Ivy and invasive buckthorn on Towle Field on the Towle Conservation Land.
- Develop yearly and long-term budgets for the maintenance for each parcel.
- Renew, revise, and clarify the Cranberry Bog Maintenance Agreement.
- Continue to support repair of the Greenough Dam on the Greenough Conservation Land.
- Coordinate responsibilities for providing annual funding for maintenance of the Benfield Conservation Land with the Housing Trust and the leaseholder for the Benfield Farms housing development on South Street.
- Help the Recreation Commission evaluate the suitability of conservation land for future athletic fields or evaluate future purchases as multi-purpose conservation or recreation sites.
- Develop forestry management plans for identified tracts on conservation lands.
- Develop agricultural management goals and incorporate those goals in the awarding of agricultural licenses.
- Continue to support the Land Stewardship Committee.
- Regularly review regulations for camping on conservation lands to provide best guidance for camping.
- Continue to review rules associated with the Community Gardens on Foss Farm to ensure fairness for all.
- Develop a Conservation Land Management Plan.
- Review proposed trails for habitat impact.
- Maintain signs on conservation lands.
- Install or maintain kiosks on all the major properties, and provide current maps and wildlife information in all kiosks.
- Support efforts to encourage agriculture in Carlisle and also efforts to reduce conflicts between agricultural activities and nearby homeowners.
- Evaluate areas and methods for encouraging native pollinators.

#### *Encourage Conservation Restrictions.*

- Maintain and support activities of the Conservation Restriction Advisory Committee (CRAC), including the periodic field inspections of CRs.
- Continue to improve file information on CRs and continue the accurate depiction of CRs on the Town's Assessors maps.
- Work with the Planning Board to ensure that Open Space in Conservation Clusters, Senior Residential Open Space Communities, Residential Open Space Communities, and other limited development options are adequately demarcated in the field so that property owners understand that a CR and/or conservation property exists and where the boundaries are.

- Work with the Planning Board to assure that Open Space developments protect those portions of the land that optimally should be conserved.
- Develop a standardized enforcement procedure to handle CR violations.

*Promote Wildlife Management.*

Plant and Wildlife Inventory

- Support an official repository for recording and updating the biodiversity in Carlisle. Such a repository could bring together the work already being done by interested and competent parties to track changes over time and to provide a basis for decision-making by any town body.
- In order to protect species diversity adequately, continue a project through volunteer participation to survey wildlife in town (Appendix D).
- Support mapping of vernal pools.
- Work with the Massachusetts Natural Heritage & Endangered Species Program to map rare plants and animals in town.
- Support efforts by qualified individuals and organizations to monitor rare species and species in decline located in Carlisle.
- Encourage reporting of observed listed wildlife species, including plant species.
- Support reporting of invasive species.

Wildlife Management

- Explore management options when wildlife and human populations conflict (e.g., expanding deer, coyote, and bear populations; disease-bearing wildlife such as deer ticks and mosquitoes).
- Explore ways to encourage native pollinators.

*Control Pollution.*

- Work with the Department of Public Works on resurfacing projects to protect wetlands from road-salt runoff using best management practices.
- Seek reduction in use of road salt through adoption of best management practices.
- Seek the use of best land management practices during construction by developers through adequate review and comment on permit filings.
- Investigate eco-friendly pest control for private mosquito control.

*Increase Accessibility.*

- Make the paths around the Cranberry Bog accessible for OPDMDs with low-cost improvements.
- Monitor the implementation of Carlisle's OPDMD Rules and Regulations, and suggest revision as necessary.
- Consider accessibility improvements whenever parking or other facilities are improved or constructed.
- Develop a review and grievance procedure so that the public can suggest how to improve access to conservation lands (Table 11 and Appendix F).
- Support the installation of properly constructed and maintained pathways and trails as a means of improving access to scenic vistas and conservation lands.

## **Land Protection**

### *Promote Acquisition Programs.*

- Periodically review and confirm selection of parcels essential to meet recommended goals, and acquire parcels as available for open space to round out existing holdings; link major trails, major pieces of open space, or both; preserve land for passive recreation and wildlife management. (e.g., Keep balance of fields and woodland; protect rare species.)
- Continue to protect areas in the southwest sector (Map 7) to create a western corridor from the Chelmsford border to the Concord line, preserving land from the Sorli farm on Westford Street and the Valentine farm on Acton Street with their vistas and also Spencer Brook. (*Note: This goal is consistent with the Metropolitan Area Planning Council (MAPC) MetroGreen recommendations.*)

### *Pursue Programs Not Involving Full Acquisition.*

- Seek permanent conservation restrictions on properties not needed for active or passive recreation. Particularly suited for conservation restrictions are those sites whose main values include vista, aquifer, agriculture, wildlife habitat, or trail corridors.
- Explore possibility of securing conservation and agricultural restrictions for various priority parcels.

### *Practice Planning.*

#### Yearly review

- Set aside time each year to review goals and priorities. Be proactive in preservation and land management.

#### Early planning for large parcels

- Work with the Carlisle Land Trust, CCF, and landowners to plan protection of large properties to ensure that conservation values can be preserved. Where some development is financially necessary, suggest a Conservation Cluster development, Residential Open Space Community, Senior Residential Open Space Community, or other limited development options. Where appropriate, work with the Municipal Land Committee and Carlisle Housing Trust to help meet additional town needs while preserving a property's conservation values and providing open space associated with such a development.

#### Grants

- Maintain eligibility for state discretionary grants.
- Continue to work with the Bay Circuit Trail Program to find and to protect areas of mutual town-state benefit. Become informed of the open space components and objectives within MAPC's MetroFuture regional plan for Metro Boston through 2030. Explore other state and federal programs that may assist Carlisle or Carlisle/Bay Circuit trail projects.

## **H. Conservation Restriction Advisory Committee Initiatives for 2020 through 2027**

The Conservation Restriction Advisory Committee (CRAC) advises the Town on the acceptance of new conservation restrictions (CRs) and monitors those conservation restrictions held by the Town. The committee strives to educate property owners with CRs and all Carlisle residents on the benefits of conservation restrictions, including preservation of open space, scenic vistas, trail connections, and wildlife habitat. Plans for the next seven years include the following.

### **Advising the Town on new conservation restrictions**

CRAC will review and advise the Town on new proposed conservation restrictions. An example of this activity is the new CR#68 (Woodward Land) on Bedford Road that was created during 2019.

### **Monitoring of conservation restrictions**

CRAC will periodically conduct site visits to properties that have Town-held CRs. The goal is to have every property visited on a 5-year cycle. The site visits will be conducted after obtaining permission of the property owners. A CR inspection report, documenting the condition of the site, the presence or absence of CR violations, and CR boundaries, will be prepared and approved by CRAC after each site visit and stored at Town Hall to be available to the public.

If violations of the terms of the CR occur (such as trash dumping, unauthorized vegetation clearing, building of unauthorized structures, etc.), CRAC will initiate discussions with the property owner in conjunction with the Conservation Administrator and help develop strategies for mitigation.

### **Educating property owners**

CRAC will periodically send letters to owners of properties with CRs to remind them of the existence of the CR on their properties and their responsibilities and to provide a list of frequently asked questions on CRs.

CRAC will also periodically publish articles and reminders in the *Carlisle Mosquito* (the local town newspaper) on Town-held CRs.

## **I. Council on Aging Initiatives for 2020 through 2027**

- Support the development of a community center to accommodate the myriad of recreational and educational programs offered by the town. The COA is concerned about the potential isolation of seniors in town and believes that the integration of seniors through activities and outreach is paramount to their ongoing health. The growing proportion of seniors in Carlisle and aging boomers become more physically active as they retire. They need additional space and facilities to pursue active and healthy lives. A feasibility study for a community center at the Moseley Land in Carlisle was recently completed. The presentation to the Select Board was made by the Community Center Advisory Group in March 2020, and a request was made to appoint a working group to continue the project and initiate a fund-raising campaign.
- Expand the supply and mix of housing options for moderate and low-income seniors. Although there is a continued demand for “affordable housing” as defined by the state, the seniors who wish to “age in place” also need more market-rate housing condominium options, much like Malcolm Meadows, that fits their income profile (i.e. units priced under \$500,000). Encouraging accessory apartments in existing dwellings would also increase housing diversity.
- Expand transportation resources and options to respond to the increasing transportation needs of seniors to access facilities and services within the town and in nearby towns.

- Create recreational opportunities and leisure activities for all ages. The COA expects to continue to be the main resource for senior activities; however, we will continue to work with the Gleason Public Library, the Carlisle Cultural Council, and the Recreation Commission to expand program offerings for all ages.
- Expand our “walkable” community through pathways and crosswalks to improve pedestrian safety. Over the past 10 years, Carlisle’s pathways and crosswalks have been dramatically expanded in all directions from the Town Center. The COA continues to support the extension of pathways throughout the town. We also promote the “walking group” on town pathways and trails and work to expand the number of pathways that could be adapted for seniors and people with disabilities. We will continue to work with the Trails Committee to increase access to other facilities and accessible trails within the town.
- Raise senior citizens’ awareness of open space and recreational resources by including notices in the COA monthly newsletter, through the *Carlisle Mosquito*, and on Minuteman Media Network.
- Support municipal priorities that focus on the needs of seniors, including expanding tax relief (especially for long-term residents) to allow more seniors to remain in town. A request to the Select Board was made to include an article in the 2020 Annual Town Meeting warrant on tax deferral eligibility and lowering the interest rate charge.

## **J. Deer Control Committee Initiatives for 2020 through 2027**

The Deer Control Committee’s objective is to define, implement, and administer regulations (with Select Board approval) to mitigate the impact of deer overpopulation in the town and to manage hunting on Town land.

### **Metrics**

The Committee proposes to partner with other conservation-related boards, committees, researchers, and non-profit conservation organizations to establish a set of metrics on the health of our open space. The Committee is particularly interested in establishing metrics relating to the impact of deer overpopulation on overbrowsing of certain plants and the impact of such overbrowsing on the long-term health of the forest. Because there may be pockets of higher or lower deer populations in different parts of town, these metrics should be assessed specific to particular areas. This undertaking should be part of a larger effort to assess the overall health of the forest including its biodiversity of plant and animal life, the quantity and impact of invasive plant and animal species, and the existence of rare species and the specific needs of their habitats.

The Committee would also support establishing exclusion zones, which are areas where deer are unable to browse so we can do long-term comparison of what the forest would be like without deer browsing and compare that to the rest of the forest for an assessment of plant and animal health and biodiversity.

Metrics that are proxies of forest health that attempt to assess the number of deer in town should also continue to be gathered including tracking deer-car collisions, number of deer taken by

hunting on both private and public land, and assessments of fresh deer tracks and scat at particular times of year, among others.

### **Public Outreach**

The Committee proposes to continue its efforts at public outreach both to make people aware of the deer overpopulation problem and continually to improve, through public feedback, on program(s) to reduce the deer population.

To that end the Committee intends to hold regular dedicated public input sessions, to hold monthly working meetings with a time for public input at each, to host speakers on this topic when possible, to respond promptly to any individual resident's correspondence, and continually to update the Town's Deer Control Committee web pages with new information as it becomes available.

The Committee also hopes to partner with other nearby towns and conservation organizations to improve region-wide public communication on the topic of deer overpopulation and management.

Outreach to certain private landowners is also something the Committee would like to consider. There are many private properties in town that either abut Town property or that are by themselves large enough to support the possibility of hunting for the purpose of reducing the deer population. Enabling such landowners to be aware of what they can allow near their property on public land or do themselves on their private property should they choose to do so could potentially help address the problem of deer overpopulation in an effective manner.

### **Deer Management**

The primary objective of the Committee is to reduce the deer overpopulation in the Town of Carlisle, thereby mitigating the impact they have on the open space. At a minimum, we would like to hold the population steady to prevent it from growing, but a more aggressive reduction in population would be preferred to mitigate the impacts already observed on the Town's lands.

The Committee is open to all options for deer management. Hunting is a controversial solution in town. We welcome investigation into alternatives and will seek out such alternatives and work proactively to try them out where possible. At this time, hunting is deemed to be the most effective and cost-efficient means of managing the size of the deer population, and bow-hunting is deemed to be the safest form of deer hunting, although it does not tend to reduce the population as rapidly as other forms of hunting.

If the Select Board chooses to continue the bow-hunting program each year, the Committee intends continually to improve the regulations to find the best solution for reducing the deer population while having minimal impact on other users of the open space.

## **K. Finance Committee Initiatives for 2020 through 2027**

Assist in analyzing the financial aspects of an Open Space and Recreation Plan and how initiatives may be prioritized in the 2020 Carlisle Master Plan.

Evaluate each new project on its merits within the context of the Town's current and projected financial situation.

## **L. Historical Commission Initiatives for 2020 through 2027**

*1. What changes would you recommend related to open space and recreation offerings in town from the perspective of your committee group?*

The Historical Commission would like the ability to maintain and sustain open spaces in the historic district with an ongoing maintenance plan to preserve its historic look and feel. Open spaces would encompass the Central Burial Ground, Center Park, the Common, and vistas in and around roadways in the historic district.

*2. What can your committee/group do to improve open space and recreation offerings in Carlisle?*

The Historical Commission is developing a plan to begin restoration of the Central Burial Ground in 2021.

*3. If your board/committee group made recommendations or developed initiatives for the 2013 OS&RP, what is the progress on each of these items?*

Historical Commission Initiatives for 2013 through 2019: The Historical Commission would like to see the creation of an improvement and ongoing maintenance plan for the Town Common and would like to take the lead in the development of such a plan. There has been no progress on this plan due to some confusion over who has jurisdiction over management of the Common.

*4. In light of your progress, what changes would you make in your recommendations or initiatives for the next seven years?*

The Commission recommends that the DPW consult with a professional arborist annually to review the vegetation and trees on the Common and develop an ongoing maintenance plan.

## **M. Housing Trust Initiatives for 2020 through 2027**

Over the next seven years, the Carlisle Affordable Housing Trust (the Trust) expects to continue to look to site affordable housing in locations and in ways that coordinate with recreational opportunities and open space. Almost unique among Massachusetts cities and towns, conservation, recreation, and affordable housing supporters have cooperated in practical and effective ways in Carlisle. In 2004, the Carlisle Conservation Foundation (CCF), working with the Town of Carlisle's Conservation Commission, Recreation Commission, and Planning Board, among others, provided the Town with an option to acquire the 45-acre Benfield "Parcel A" property on South Street for multi-purpose use. With a well and the septic system on the conservation parcel, 26 units of affordable, rental, senior housing were constructed on 4.4 acres of the land fronting on South Street. The conservation parcel includes public trails and a wildlife viewing platform built out over the expansive wet meadows of Spencer Brook at the southeastern edge of the property. The senior housing development includes a trailhead and six parking spaces for these public trails and the wildlife viewing platform.

In 2012, the Trust, working with CCF and supporters of active and passive recreation, proactively obtained a purchase and sale agreement on the 5-acre Goff property on Bedford Road, connecting the existing active recreational complex on the Town-owned Banta-Davis property with the

Fox Hill Conservation Land. In November 2012, a Special Town Meeting and debt-exclusion ballot vote approved the funding for the purchase of the property for group homes for developmentally challenged adults, for a second means of access to Banta-Davis, and for trail connections among the School property, Banta-Davis, and Fox Hill (allowing connection via the Rodgers Road trail and Stearns Street to the Malcolm Preserve and Estabrook Woods). Special Town Meeting also approved use of the Goff property, now known as the Moseley Land, for other recreational uses in conjunction with the above, which may include a community and/or senior center, tennis and basketball courts, and/or playing fields.

## **N. Land Stewardship Committee Initiatives for 2020 through 2027**

### **Property maintenance and improvement**

- As requested, provide input to, and review of, plans for the future of the Cranberry Bog Conservation Land including the Bog House.
- Seek discussions with ConsCom and Trails Committee regarding the desirability of managing certain conservation lands, or portions thereof, with high conservation value just for wildlife habitat and diversity, i.e., strictly for conservation.
- Seek a discussion with ConsCom regarding an increase in Town support, including funding, for Town-owned conservation lands to be used not only for maintenance, but also for recreation, studies, invasive plant control, and more.
- Seek an increase in LSC membership (currently 6) to allow more effort on property management.
- Increase the frequency of LSC monitoring of major Town-owned conservation parcels for problems or areas of concern.
- Continue working to provide handicapped access to trails on appropriate properties.
- Complete the ongoing project to evaluate the contents and condition of all ConsCom or LSC signage on Town-owned conservation lands, and purchase and install new or replacement signs as necessary.
- Coordinate with ConsCom in dealing with vandalism, encroachments, and cleanup on Town conservation land.
- Continue monitoring of the projects for invasive plant removal on Towle Field and Foss Farm; continue informal monitoring of invasive plants on other properties.
- Meet with ConsCom on a regular basis to obtain its input on LSC tasks it would like to see initiated, moderated, or expanded.
- Assist ConsCom by screening proposals for activities (not related to the Wetlands Protection Act) on Carlisle's conservation lands.

### **Outreach and education**

- Work with other environmental groups in Carlisle to re-start the holding of an annual meeting of all conservation groups in Town.
- As resources allow, plan public programs and events on topics such as wildlife habitat, invasive species control, or other environmental issues affecting the Town.
- As resources allow, prepare educational areas such as marked nature trails, native wildflower gardens, pollinator gardens, etc.

### **Rules and guidelines for conservation land use**

- Continue to consider needed revisions to existing conservation land regulations, but also the drafting of new or revised regulations for ConsCom consideration, e.g., drone use, camping, wildflower planting, night use of conservation lands, dogs, etc.
- Update the list of Town-owned conservation lands which have (or should have) recommended guidelines for the use of Other Power-Driven Mobility Devices.

### **Baseline Assessments and Management Plans**

- Prepare additional Baseline Assessments and Management Plans for the larger or more significant Town-owned conservation lands.

### **Special reports and projects**

- Continue the analysis of the conservation value of Town-owned tax parcels for ConsCom. Make recommendations for parcels that ConsCom should seek approval to manage.
- Continue to work with the Cranberry Bog Subcommittee of Carlisle and Chelmsford on issues of common concern, including new wells and dike repair.
- Identify and evaluate mechanisms for funding special projects on conservation land.
- If resources permit, conduct special studies on conservation lands, for example:
  - Property boundaries (markers and encroachment)
  - Wildlife habitat assessment
  - Invasive plants, or
  - Deer impacts such as plant browse.
- Evaluate the feasibility of monitoring particular stressors on conservation lands due to climate change (e.g., changes in: precipitation and hydrology, flora and fauna diversity, invasive plants and pests, surface-water temperatures, etc.)

## **O. Planning Board Initiatives for 2020 through 2027**

### **Use the permitting process to preserve open space and to minimize disturbance of the existing landscape.**

In 2010, the Planning Board developed and adopted as part of its rules and regulations for all types of development in town a set of General Development Standards to “assure that development will not adversely impact the environment, particularly the private water sources exclusively relied upon by Carlisle residents.” The Board will continue to encourage development patterns that preserve water resources and natural recharge of the underlying aquifer; existing trails and the opportunities for connections to and between protected open space and other trails; and vistas, stone walls, natural buffers, and wildlife corridors.

Where development is proposed, the Board has long encouraged the use of Conservation Clusters, Senior Residential Open Space Communities (SROSCs), and common driveways as an alternative to standard subdivisions to preserve as much as possible of the existing landscape and other natural resources and to provide and improve access to existing open space. In October 2017, the Town approved a new zoning bylaw that provides for expanded opportunities for clustered developments. Modeled on the SROSC, the new bylaw, entitled Residential Open Space Communities (ROSC), provides that smaller dwellings can be grouped closely together provided that certain amounts of land are designated to be conserved and deeded to the Town. This new

bylaw allows for the benefits of the SROSC bylaw to be extended to housing for all age groups. In July 2019, the Planning Board approved the first ROSC at Woodward Village on Bedford Road, providing 32.4 acres of public open space.

The Board will also coordinate with the other Land Use Boards and the Building Commissioner to ensure compliance with local bylaws designed to restrict development that may place an unreasonable demand on scarce natural resources, particularly adequate supplies of drinking water.

In 2016, the Planning Board became primarily responsible for carrying out Site Plan Review, taking over that responsibility from the Select Board. In carrying out Site Plan Review, the Board will consider and prioritize preservation of and access to open space and recreation areas. The Board will strive to ensure that non-residential development is optimally sited to protect and preserve natural areas, wetlands and wetland buffers, and habitat for rare or endangered species.

The Board will continue to review applications for alterations of stone walls and tree removal along local scenic roads under the Scenic Roads Bylaw, in all cases considering the preservation of natural resources, historical values, and aesthetic characteristics. The Board will also seek to recommend Town Meeting designation of additional roadways as scenic roads to protect natural and historic rural vistas. It will work to integrate GIS into all aspects of Town government to facilitate delivery of services and mapping required for planning documents and initiatives.

#### **Complete the Carlisle 2020 Master Plan.**

At Town Meeting in April 2019, upon a proposal by the Planning Board, the Town approved initiation of a town-wide master planning effort. The Town allocated a total budget of \$160,000 to hire a consultant, Civic Moxie, and to cover associated expenses. A volunteer Master Plan Steering Committee, appointed by the Planning Board, is leading the effort. The steering committee established a time line and scope of work, with the goal of finishing the plan in the fall of 2020. This effort represents Carlisle's first comprehensive master planning effort since the 1960s (although a Study plan was prepared in the 1990s).

The Planning Board oversees the entire master plan effort and is very engaged in the process. With respect to goals and priorities in the areas of open space, housing, and recreation discussed in earlier versions of this OS&RP, the Planning Board anticipates a two-pronged approach. The Board will seek to gain information and insight from the master plan process for its already identified initiatives, such as expanding the use of GIS and examining the Accessory Apartment bylaw. For other goals and priorities, the Board will await the results of the process and the extensive town outreach efforts that are part of the master plan before articulating new goals and priorities.

#### **Help develop Town-wide strategies for improving housing diversity while maintaining Carlisle's rural character.**

The Planning Board will continue to work with other Town boards and committees to develop strategies that will allow rational planning for housing development, public facilities, and land preservation in the locations desired by the Town, rather than entrust this future development to the comprehensive permit (40B) process, which limits local controls.

As discussed above, in the fall of 2017, Carlisle Town Meeting adopted a new cluster bylaw, the ROSC bylaw. This bylaw provides for clustered housing development provided that a significant amount of open space is conserved.

Among the other housing strategies that may be considered are the following.

- Work with the Select Board and Housing Trust to renew discussions about Local Initiative Project (LIP) guidelines that strike the right balance between creating adequate economic incentives for developers seeking to build denser developments for affordable housing with the necessary protections for neighbors' private wells and septic systems and the preservation of environmental and other community resources. The Planning Board has recommended draft LIP Regulations to the Select Board in the past, but they have not been acted upon.
- Consider creation of a new overlay Residential District zoned for denser development in specified locations (based on land characteristics to meet specified "carrying capacity" criteria, buffering, and impacts on neighboring properties) in conjunction with Town-directed local initiatives.
- Review the Accessory Apartment bylaw to see whether changes should be made to increase use. Partner with the Council on Aging to conduct outreach and education regarding the existing bylaw. Consider whether to recommend additional Town subsidies and involvement to promote the use of the bylaw.

#### **Review revised State policy for Stormwater Management.**

Both federal and state laws and regulations regarding stormwater management have changed and evolved since the 2013 version of this plan. However, many of these laws and regulations exempt Carlisle due to its population size and low density. Nevertheless, the Planning Board will continue to apply Town drainage standards and widely recognized Limited Impact Development standards vigorously to all construction of roadways, driveways, and other hardscaped areas.

### **P. Recreation Commission Initiatives for 2020 through 2027**

**The Recreation Commission has adopted the following long-term priorities.**

- Protecting and improving the existing recreation facilities
- Improving access to Carlisle's recreation facilities
- Increasing available playing fields to meet Carlisle's proportionate contribution to Concord-Carlisle's athletic programs
- Expanding the recreation facilities to serve new activities and populations

**The following initiatives will support these priorities.**

- Professionalizing the maintenance of the playing fields, playgrounds, and other facilities
- Reconfiguring and renovating Spalding field
- Building an artificial turf field
- Building a multi-purpose, multi-generational recreation center
- Building additional tennis courts
- Adding pickleball lines to the existing tennis courts
- Building a fenced-in dog park
- Developing seasonal access to a skating pond

### **Protecting and improving the existing recreation facilities**

The scarcity of town-owned land suitable for development consistently threatens the existing recreation infrastructure. For instance, in the past decade alone, the Banta-Davis land has been proposed to be converted to an affordable housing facility, to a solar farm, and to the site of a new Town Hall. There are no suitable replacements for recreation, and so protecting this property as a recreation site is an important priority for the Recreation Commission.

Improving existing facilities is an important priority; it will fulfill many other priorities if it can be accomplished effectively. Several of the facilities at Spalding field are out of use due to surface and subsurface water issues, subsurface material issues, and to a suboptimal configuration. Fixing these issues and utilizing Spalding field more effectively will substantially increase the available athletic fields and may improve the diversity of athletic and recreation opportunities overall. In 2019, Carlisle Town Meeting authorized \$20,000 for a study of these issues; the study is expected to be initiated in 2021.

Substantial progress has been made in recent years to improve the condition of the fields, especially at Banta-Davis. Since 2015, the Recreation Commission has been transitioning the maintenance of fields, playgrounds, and other facilities away from volunteers and toward professional maintenance companies. The results of this investment have paid off in the form of stronger, greener turf and higher-quality playing surfaces. Grub infestations have been a serious problem. Under the new maintenance regime, however, there has been promising progress on this front as well. The town has been supportive with funds to attend to several deferred maintenance problems at both Spalding and Banta-Davis. Additional brush cutting, tree pruning, and hardscape repair should bring important improvements to the quality of the fields.

Additional improvements to the field system will be possible with the addition of a multi-purpose artificial turf field within the complex of fields that the town has to offer. During early season or wet periods when the fields are fragile, shifting demand to an artificial turf field makes an enormous difference to the quality of the grass fields overall. There is more on the need for an artificial turf field below.

Continuing to maintain all fields and facilities through professional maintenance plans will ensure that mowing, planting, removal of Poison Ivy, fence repair, brush cutting, mulch spreading, field treatment, and all related maintenance are done in a timely and efficient manner, thereby optimizing use of these town assets.

### **Improving access to recreation facilities**

There is currently little to no ADA access to the recreation facilities at Banta-Davis or at Spalding. The issue is especially important as our population ages. A key problem is the unpaved parking lot at Banta-Davis, which is difficult to navigate with a cane, by wheelchair, or with a stroller. The topography of the facility also contributes to this problem, as one of the main fields is at the base of a slope. Developing access to these sites is not an overwhelming problem, however. Carlisle participates in the Community Preservation Act fund; with these and other funds Carlisle has the resources necessary to address these issues in the years to come.

**Increasing the available playing fields to meet Carlisle’s proportionate contribution to Concord-Carlisle’s athletic programs**

Carlisle contributes insufficiently to the available fields required in the youth programs co-organized with Concord. As a result, Carlisle families must travel more miles, more often, and are also subject in some cases to additional user fees for these fields. The travel issue can be a significant challenge; although Carlisle is adjacent to Concord, some parts of West Concord are a long way away. These programs usually require travel at rush hour. Additional fields and opportunities to pursue these sports closer to home would make a big difference to Carlisle families. If the field contributions were proportionate, Concord residents would have to travel more, but the burden would be more reasonably shared among Concord and Carlisle families.

Lacrosse and field hockey, two sports with substantial Carlisle interest and participation, generally require artificial turf to be played at a high level, as does soccer. Carlisle currently has no artificial turf fields. Among the Recreation Commission’s long-term priorities is the development of a multi-purpose artificial turf field in Carlisle. A single such field would have a big impact on field equity between the towns and would draw teams and programs into Carlisle more often. The recently authorized Spalding study intends to look at the feasibility of locating artificial turf at Spalding Field.

With improvements to Spalding so that it is used effectively and with the development of an artificial turf field, the imbalance in the proportional field contributions between Concord and Carlisle will be mostly, if not completely, resolved.

**Expanding the recreation facilities to serve new activities and populations**

Carlisle’s recreation facilities have been historically mostly focused on school-age children. This was appropriate at a time when this age group dominated the town’s population, but over time Carlisle has become more diverse in the ages of the population. The Recreation Commission has a goal of developing recreation facilities that benefit residents of all ages.

One such initiative is the development of a fenced-in dog park at Banta-Davis. There are many dog owners in Carlisle, and groups of them regularly congregate now at Banta-Davis, the Cranberry Bog, and other places. Fenced areas for dog play allow owners to exercise their dogs while socializing with other owners. Another benefit is that it keeps the dogs’ activities off of playing fields, where they can do damage and leave waste. Dog parks are of relatively low cost to build and maintain and, as such, are a very efficient way to aid recreation among different age groups.

The Recreation Commission hopes to build two additional tennis courts, ideally in another location in town where residents who do not live close to Church Street may enjoy them. As Pickleball has become a popular sport, especially among seniors, the Recreation Commission intends to line some of the tennis courts for this sport.

Ice skating is popular with many children in the community. However, the seasonal, temporary ice rink used at the Kimball’s parking lot has not been successful. The Recreation Commission has a goal of finding and creating access to a suitable pond in the coming winters.

The construction of a multi-generational Recreation Center, with an outdoor swimming pool, has been planned on the Moseley Land, although no funding has yet been identified. Such a facility would create space for community programs for all ages, allow seniors to congregate and socialize during the day, and supply teens safe spaces for after-school programs and recreation. A swimming pool would greatly improve the Summer Fun camp program and open up a host of other programming possibilities for every age group.

## **Q. Select Board Initiatives for 2020 through 2027**

### **Overview**

The Select Board has traditionally outlined three intrinsic key values that guide the management of Town affairs:

- An excellent educational system,
- The conservation and protection of our unique physical environment, and
- The maintenance of strong small-town community values that support the needs of all of our citizens.

Obviously, the Open Space and Recreation Plan is a document that outlines in detail our commitment to conserving and protecting our unique environment. The document outlines the tremendous amount of work that many committees and countless individuals regularly undertake to protect and care for our environment. The Select Board is committed to support the plans and goals that are outlined in the document. The following is an outline of the specific goals and objectives that the Select Board will attempt to undertake in support of the plan.

### **Administration**

1. The Select Board will be actively involved in the recruitment and prompt appointment of qualified personnel to all appointed committees that are involved with the work of open space and recreation.
2. The Select Board will work to see that the emerging technology plans for the Town take into account the systems and support mechanisms that are essential to the proper management and conservation of our land.
3. The Select Board will work with the appropriate committees to see that budget issues or requests are dealt with openly and fairly and that any warrant articles are presented clearly and effectively.

### **Land Acquisition**

1. The Select Board will work to remain informed regarding critical targeted acquisitions and/or conservation restrictions and work with the appropriate committees regarding the most appropriate strategies for action.
2. When a particular initiative is undertaken, the Select Board will work to develop a town consensus regarding the need and appropriateness of the action.
3. The Select Board will work with appropriate committees to determine whether it may make sense to include an affordable housing initiative or other municipal use in the conceptual phase of an action.

### **Land Stewardship**

1. The Select Board will continue to work with the appropriate committees to establish ongoing budget resources to manage the properties that have been placed under conservation restrictions or another form of protection.
2. The Select Board will work with the appropriate committees regarding the issue of wildlife management, helping to manage the balance between wildlife protection and public safety and the protection of private property.
3. The Select Board will take particular interest in issues related to the protection of public ground water and work with appropriate committees to ensure that our fragile water resources are protected in balance with personal property rights.
4. The Select Board will support the Conservation Commission in its ongoing responsibility to enforce rules and regulations.
5. The Select Board will work to promote planning for the future use and preservation of the Cranberry Bog as open space in such a way that will protect Carlisle's rights and interests in the water supply.

### **Active Recreation**

1. The Select Board will support the investigation of a strategy and plan for the potential creation of a Carlisle Community Center.
2. The Select Board will support the efforts of the Carlisle Trails Committee in maintaining our current trails network, improving and extending the network, and encouraging usage of this unique resource.
3. The Select Board will work with the Recreation Commission to understand and support key initiatives relating to our fields, courts, and active recreation resources. The Board is committed to maintaining, at a minimum, the level of resources that we currently enjoy.
4. The Select Board will work with appropriate committees to explore potential extensions to the footpath network that may be appropriate.

## **R. Sudbury Valley Trustees Initiatives for 2020 through 2027**

Sudbury Valley Trustees is pleased to submit this input for the Town of Carlisle's 2020 Open Space & Recreation Plan. As a partner on several local efforts, SVT is an enthusiastic supporter of the conservation work of the Town of Carlisle and the Carlisle Conservation Foundation, and we applaud the progress that has been made since the last iteration of the OS&RP.

Because we did not participate in developing the 2013 plan, our comments are limited to the first two of the four questions that were provided to help direct feedback, and primarily to open space preservation and passive recreation.

*1. What changes would you recommend related to open space and recreation offerings in town from the perspective of your committee/group?*

There are few changes to suggest, as Carlisle has been doing a excellent job of preserving land and maintaining trails, so our comments fall more along the lines of "keep up the good work."

The 2013 seven-year action plan recommends work to protect corridors for wildlife passage as well as for recreational trail connections. This is an important goal, and we suggest the Town continue to make this a priority.

Further, it's important to look beyond Carlisle's boundaries to think about regional connections, an increasingly important need as our climate warms and species will need to migrate north. Much as we think of our region as the "lungs of Boston," Carlisle, in its relatively rural state, can be thought of as an oasis in the midst of some more densely developed communities, but should also be thought of as part of a migratory corridor beyond that represented by the Concord River. Continued work to protect land on the Western Corridor as well as along the Concord River will help with regional connectivity, but there are other opportunities to protect land that will improve connections through the center of Town.

*2. What can your committee/group do to improve open space and recreation offerings in Carlisle?*

SVT is currently working with the Nature Conservancy to incorporate data on flood and drought vulnerability into our strategic land protection work. This data should be publicly available very soon and we would be delighted to work with the Town to review it to see its relevance to Carlisle, particularly in regard to the 2013 through 2019 Board of Health initiative to protect groundwater.

If the town is not already doing so, we recommend pursuing designation as a MVP (Municipal Vulnerability Preparedness) community under the state program. This will open up opportunities for funding to protect land and implement other nature-based solutions to address the current and anticipated impacts of climate change. SVT has been involved with MVP planning efforts in other communities and is actively exploring partnerships to protect priority parcels through action grants.

We'd like to commend the Town on three specific achievements since the last OS&RP.

- Carlisle Trails Day was a wonderful concept and seemed to have been executed without any hitches. It was a terrific way to get residents outdoors and connected with conservation land, and we encourage any efforts to repeat it on a regular or even semi-regular basis. It is also an event that other towns and local land trusts might like to emulate, and SVT would be happy to work with Town volunteers to develop information for sharing through the Metrowest Conservation Alliance (MCA) or other avenues.
- Adoption of a Right-to-Farm bylaw. Carlisle has done an excellent job in supporting local agriculture and this represents an important additional step.
- Amendment to the Senior Housing bylaw. Housing demand remains high in eastern Massachusetts, and towns will need to embrace tools for denser development and smaller footprints if open space goals are to be met.

SVT supports Carlisle's outstanding planning process to meet the Town's municipal needs, achieve balanced growth, and preserve the Town's unique character in the years ahead. We look

forward to continued collaboration with Carlisle officials, staff, and volunteers to protect the important resources identified in your plan.

## **S. Traffic & Pedestrian Safety Committee Initiatives for 2020 through 2027**

The mission of the Committee is to bring attention to, and to work to eliminate, unsafe conditions for pedestrians, bicyclists, and drivers of motorized vehicles of all ages and abilities. To this end, it is tasked with the implementation of approved Complete Streets grant projects, improvement of existing pathways and road crossings, proposing new pathways and street crossings to enhance the overall walkability of Carlisle, and reviewing traffic safety concerns and issues within Carlisle, including, but not limited to, speed limits, signage, lines of sight, and traffic flow.

### **Oversee Complete Streets Grant Projects.**

- Coordinate with the selected contractor and DPW to complete projects funded through the first phase of Complete Streets funding with supplementary Town funds during summer 2020.
- Reevaluate the Prioritization Plan in light of public input regarding pedestrian safety to develop a new priority project list for the Select Board's approval to apply for the next round of Complete Streets grant funding.
- Seek supplementary funding as needed to implement successive projects to improve safety and accessibility and to expand the pathway system to improve the walkability of Carlisle.

### **Respond to public input regarding public safety and other issues beyond Complete Streets parameters.**

- Review the input received, coordinate with Town boards and committees to develop solutions, seek approvals, and seek funding as necessary to implement projects.
- Support improved public and environmental health by encouraging walking and bicycling to maximize community connectivity—especially for our aging population—and as alternatives to vehicular travel.

## **T. Trails Committee Initiatives for 2020 through 2027**

The Trails Committee continues with its mission in five areas: Mapping, Education, Maintenance, Developing new or protecting existing trails, and Advising the Select Board and other entities on trails issues.

### **Trails Mapping**

In 2018, the Trails Committee updated its trails book, *Trails in Carlisle*. The 2010 book was fully reviewed, and three new trail maps were added. New for the 2018 edition, all trail junctions were given unique letter and number identifiers, which were included on the maps to better aid trail users with location identification and emergency personnel with search and rescue, completing one of the goals in the 2013 OS&RP.

The trails book is available for purchase at Town Hall and at Ferns Country Store. Trail maps are also available electronically on the Town website under the Trails Committee web page.

Since 2015, the Committee has installed 144 intersection signposts with wooden number markers corresponding to the trail maps. We have worked with Carlisle Middle School Art Club students and art teacher Rachel Levy to add nature-themed student art to each marker. The goal is to get students and their families connected to trails and conservation land and to add interest to the trails for all users. This multi-year project is expected to be completed in 2021 or 2022.

A web-based online map called *Open Street Maps* is a preferred mapping system used worldwide by many outdoor enthusiasts. The Trails Committee has updated the information in *Open Street Maps*, so it now more accurately depicts all of Carlisle's trails.

In the next seven years, the Committee will

- Continue to update on-line town trail maps, *Open Street Maps*, and GIS databases with new trails and information about the trails,
- Evaluate level of accessibility for trails created since 2013, and
- Consider a reprint once all 2018 edition trails books have been sold.

### **Education**

The Trails Committee educates the public about the trail system in several ways. The revised (2018) *Trails in Carlisle* book includes updated information about the trail system. The Committee also maintains a section on the Town website that contains much of the information from the trails book, along with additional documents and more time-sensitive information. The Committee historically has led a variety of public walks, including a winter moonlight walk, spring vernal pool walk, a Riverfest walk, a double sundae Sunday saunter with visits to two ice cream stands, a mushroom walk, and a post-Thanksgiving Day walk. The Committee has also led walks to educate residents about new conservation parcels and trails. The Committee has also led trail walks to inform the public on the natural features of parcels of land that the Town is considering purchasing.

In 2019, CCF and the Trails Committee co-hosted the *Carlisle Community Trails Day Challenge* with the goal of collectively walking all of Carlisle's trails in one day. It was a successful event, with more than 275 Carlisleans participating, walking over 700 miles. A month-long virtual form of the event was held in the midst of the pandemic in 2020. Future *Trails Days* will be held.

The Trails Committee has sponsored chain-saw-safety workshops in the past and hosted one in 2019 given by arborist Bob Eaton. The session was well attended and well received, so the Committee will sponsor similar sessions in the future.

The Committee promotes the Carlisle Trekker Award for individuals who document hiking almost all the trails in town and volunteer a half day of trail work. As of early 2020, 44 people have completed the requirements and received the award. (Taking advantage of the pandemic, another dozen people earned the award by the end of 2020.) Announcements of the awards in the local newspaper have encouraged more people—young and old—to support our efforts and hike the trail system. Since 2016, wooden plaques created by Trails Committee Member Roy Herold have also been presented to recipients.

The Trails Committee created and maintains a separate web site containing trail maps, activities, meeting agendas and minutes, photos, and other information. The official Town website was

upgraded in 2018 and all Trails Committee material was moved to the Town website. We will continue to maintain both sites until such time as the separate Trails Committee site can be retired.

During the next seven years, the Committee plans to

- Continue to lead at least one public walk per season, with additional walks as the occasion arises,
- Coordinate nature walks with the CCF and the Carlisle Conservation Commission, including the *Carlisle Community Trails Day Challenge*, and
- Update the website as needed so that all information is current.

### **Trail Maintenance**

The Trails Committee conducts an active program to maintain Carlisle's existing trails and will continue this program over the next seven years and beyond.

Since the 2013 OS&RP, the Conservation Commission has approved the Committee to utilize duckboards, which are narrow boardwalks placed directly on the ground to allow a trail user to bypass wet or muddy areas of trail. With 200 feet of duckboards installed to date, this technique has been very successful and will be utilized in the future in situations where large permanent boardwalks are not required for the amount of water present.

In the past two years, the Committee has designed, constructed, and installed 8 trailside wooden benches. Another 9 benches have been pre-constructed and will be installed in the near future. The Committee would like to thank Bert Willard for creating the bench design and for constructing the first five benches.

Activities include the following.

- Utilize local volunteers to maintain and improve trails.
- Coordinate and execute cleanup of trails after major storms.
- Host workdays for trail clearings, which also are used to teach volunteers about land stewardship, local invasive plants, and other aspects of trail maintenance.
- Develop a strategy for controlling Poison Ivy growing along trails.
- Coordinate regional trail development with our trail system. These may include the Bay Circuit Trail, Bruce Freeman Rail Trail, or the Concord River Boater's Trail.
- Continue our relationship with Sudbury Valley Trustees for trail maintenance on the Elliott Concord River Preserve.
- Construct new boardwalks and duckboards where needed and repair existing ones as required. (New Russell Conservation Land and Greenough boardwalks are planned in 2020.)
- Complete the installation of trail junction number signage developed for safety considerations, particularly in relation to the search and rescue needs of the Carlisle Police Department.
- Continue working with Carlisle Middle School Art Club students and art teacher Rachel Levy to add student artwork to new trail junction number signs and replace ones that wear out.
- Construct and install trailside benches in appropriate locations.

New initiatives that may require additional funding from the Town or through grants and a commitment from the Town include the following.

- Promote the creation and maintenance of parking spaces located at or near the entrance of trails.
- Survey existing signage on all trails to assess opportunities for signage for people with disabilities, including informational signage for people who are sight-impaired.
- Survey existing trails to determine which portions may be made more accessible to people with disabilities, with appropriate funding to effectuate the necessary modifications to access points and the trails themselves, as well as the expected costs of maintenance.
- Negotiate an updated Trail Agreement with U.S. Fish & Wildlife Service to allow the Trails Committee to continue to maintain the trails and to use material storage facilities at Great Meadows National Wildlife Refuge.

### **Developing New Trails and Easements**

The Trails Committee frequently collaborates with Town boards, other Town committees, CCF, and developers to help locate new trails and to encourage granting of easements or other forms of public access. Once trail access has been secured, the Committee organizes volunteers to locate and clear the trails and build improvements such as boardwalks.

The Trails Committee has successfully resolved some items and constructed new trails, many identified as goals in the 2013 OS&RP, as follows.

- Connected Carlisle Pines to the MacAfee Trail, with connection to Westford and Chelmsford trails.
- Created Bartlett Farm easement and rerouted trail, with a new Conservation Restriction allowing perpetual public access.
- Banta-Davis Land: Improved connections from school and neighborhoods, constructed boardwalks from Rodgers Road and between Spalding Field and the Banta-Davis Land.
- Constructed trails on the Russell Conservation Land, which was acquired by the Town. A boardwalk and staircase are planned to be installed in 2020 to provide access to the parcel from Russell Street.
- Constructed the Woodhaven Trail, with help from CCF and SVT (which acquired the CR on Woodhaven Farm in 2016), with a connection from Prospect Street via a trail easement through a field into the Davis Corridor, across a new boardwalk, and connecting to the Davis Trail.

During the next seven years, the Trails Committee will continue these activities, including the following.

- Coordinate with Town boards, Town committees, and CCF to educate the public on the existence of trails or possible connections between trails.
- Inform the Planning Board and Conservation Commission about the location of major trails on private land.
- Attend Planning Board meetings as appropriate during hearings for developments that involve trails.
- Work with the Conservation Restriction Advisory Committee, CCF, and other groups to permanently protect trails.

- Work with trail groups in surrounding towns to provide inter-town trail connections.
- Develop the trail network in the Woodward conservation land. The completion of the Woodward Village development will provide access to important existing trails and access from Maple Street to GMNWR.
- Coordinate with other Town boards including the Select Board, Conservation Commission, and Land Stewards on trail issues as needed.

The Trails Committee will also work with landowners and developers to preserve and protect public access to trails, including the following opportunities for potential trail connections.

#### **North-West Connections**

- Morse Road: public access along the entire length, GBFSP to Conant Land
- Holmes Avery Land to Fiske Street and to Elm Street in Chelmsford
- Cranberry Bog to Fiske Street via 164 Fiske Street (Jacobellis property)
- Cranberry Hill Road to Acorn South Trail in GBFSP
- Aaron Way to Conant Land
- Elizabeth Ridge Road to Munroe Hill Road
- Hanover Hill to Hart Farm Road

The first would secure a long sought-after connection between GBFSP and the center of town via the Conant Land. The next three would provide access to GBFSP and the Holmes Avery Land to nearby neighborhoods. The last three would increase trail access to the Virginia Farm/Munroe Hill/Hanover Hill neighborhoods.

#### **West Connections**

- Valentine land to Bruce Freeman Rail Trail and to Sorli Farm
- Sorli Farm to Carlisle Pines
- Pathway from Hanover Hill to Curve Street and then to Bruce Freeman Rail Trail

The pathway extensions would provide safe passage westward along Westford Street to Curve Street and beyond to the Bruce Freeman Rail Trail.

#### **South-West Connections**

- Access to the trails on CR #56 (Lovejoy) adjacent to Benfield Hill and then to Heald Road
- Benfield Hill to South Street and Benfield Conservation Land
- Benfield Conservation Land to Spencer Brook Reservation, to Fifty Acre Way, and to the Bisbee Land
- West border with Acton: Ben's Woods to Acton Street, including connections to Log Hill Road, Robbins Mill Conservation Land in Acton, CCF land off High Woods Lane, and Valentine land
- Bisbee Land to Estabrook Woods and to Spencer Brook lands in Concord
- Greystone Trail to Concord Street via CR #62 (Stalker)
- Pathway along South Street from Concord Street to Cross Street

These connections would enhance pedestrian access to many of the town's preserved open space parcels in the southwest corner of town and would secure protection for the wildlife corridors from Acton's Spring Hill and Robbins Mill areas through the Spencer Brook lands and into Estabrook Woods.

### **South Connections**

- Sachs Greenway to Rockstrom Trail via Raibert property (previously Flannery property)
- Russell Conservation Land to Concord Street via Rotondo parcel, to Clark Farm, and to Russell Street via 149 Russell Street
- Kulmala Trail to Concord Street and Russell Street
- Buttrick Land to Autumn Lane

The first is a keystone property within the Estabrook Reserve for pedestrian and wildlife access, completely surrounded by protected land, with a critical trail connection. The next group of connections would enhance the recently acquired Russell Conservation Land. The last two would provide access to nearby neighborhoods.

### **Center Connections**

- Kimball's to Cutters Ridge trail easement, to Brook Street, and to Carriage Way
- Cutters Ridge Road to Tophet Road
- Pathway on Westford Street from Town Center to Towle Land
- Towle Land to Concord Street
- Banta-Davis to Baldwin Road
- Old Morse Road to Great Brook Farm State Park via Fisk Meadow

These connections will make the center of town more walkable.

### **East Connections**

- Beaver Trail Loop to Maple Street
- Blood Farm Trail to Stoney Gate
- Pathway on Bedford Road from Kimball's to Davis Corridor and on to River Road
- Page Brook Road to Peter Hans Road via von Roesgen property
- Davis Trail to Rodgers Road via 165 Stearns Street (Dennison property)
- Davis Road to Page Brook Road or Brook Street
- Woodward to Foss via Anderegg property

The first three are important connections since they would help to tie the Davis Corridor with Kimball's, Great Meadows National Wildlife Refuge (GMNWR), and Foss Farm. The next three would enhance the walkability of the greater Brook Street neighborhood. The last would allow bicycles, dog walkers, and horseback riders access to Foss Farm from Maple Street.

### **North-East Connections**

- Pathway on East Street from Partridge Lane to Ice Pond Road and on to Rutland Street
- Tophet Loop East trail in GBFSP to gate on East Street
- Wolf Rock in GBFSP to Wolf Rock Road
- Deer Run Trail in GBFSP to Rutland Street
- Rangeway trail to East Street, Nickles Lane, and North Road
- Mannis Land East to North Road and Rangeway trail network
- Oak Knoll Road to Mannis Land and Maple Street or Greenough Land
- Town Forest connections to Brook Street, Carroll Drive, Milne Cove Road, and East Riding Drive via 445 East Riding Drive (Frizzell property)

The pathway extension would improve the safety of walkers along East Street where the road is narrow and winding. The next three would provide important access to Great Brook Farm State

Park. The next four would provide access from the Oak Knoll and North Road neighborhoods to the Rangeway and Mannis Land conservation lands, which would then allow access to the Greenough Land and Great Meadows National Wildlife Refuge beyond.

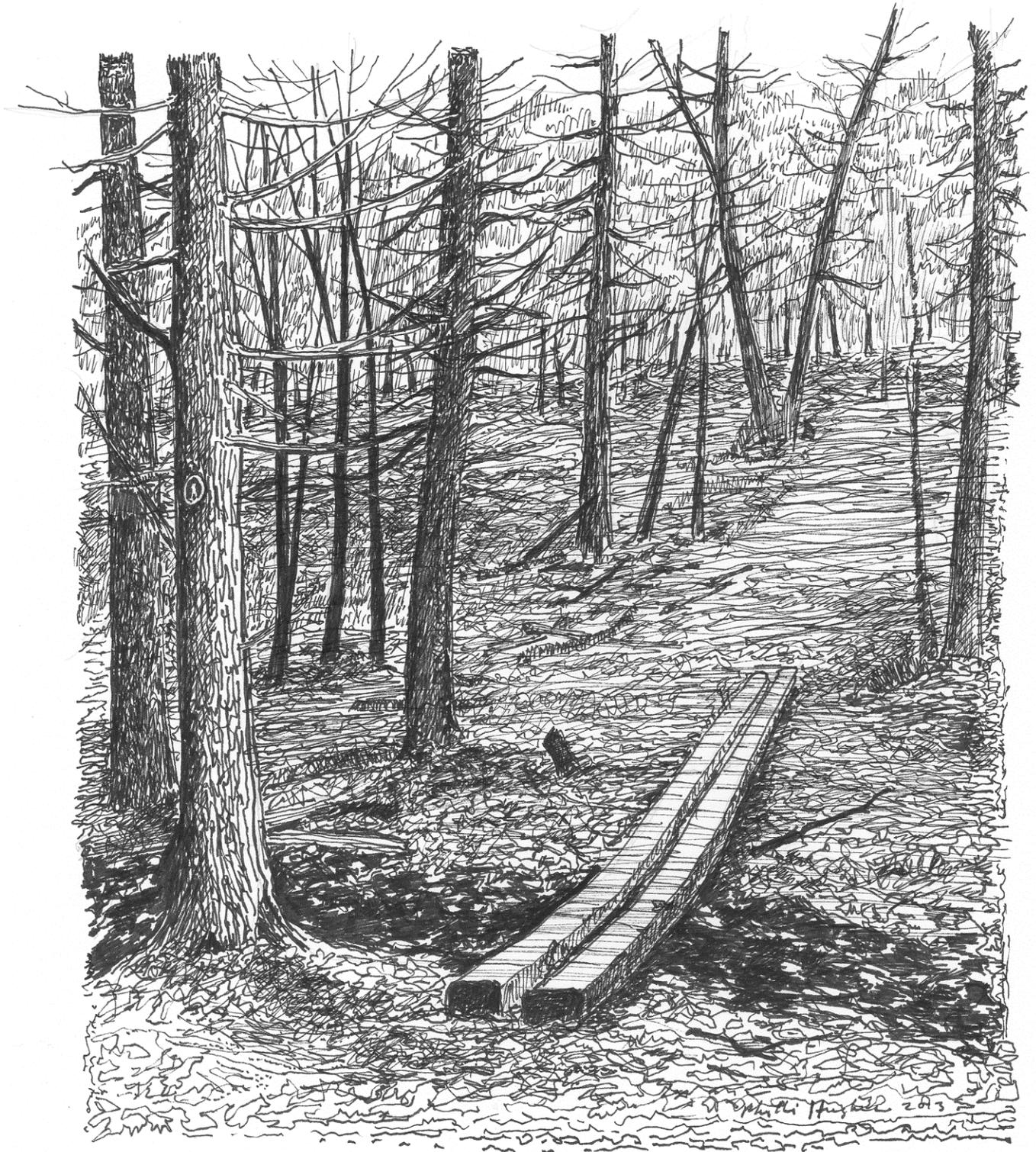
## **U. Youth Commission Initiatives for 2020 through 2027**

The Carlisle Youth Commission (CYC) is a town committee made up of 5 to 8 Carlisle parents with middle-school-aged children. The primary goal of the CYC is to provide safe, all-inclusive, and fun monthly events for Carlisle middle school students (grades 6-8) attending public and private schools to socialize with their peers. These monthly events have become known as Friday Night Live (FNL). FNL is typically held on the first Friday evening of the month in the Corey Gym and Exercise Room at the Carlisle Public School. Although FNL is held at the Carlisle Public School, FNL is sponsored and partially funded by the Town of Carlisle rather than by the Carlisle Public School.

### *Goals for the Carlisle Youth Commission (CYC) from 2020 – 2027*

- Establish the protocol for number of Youth Commissioners and number of Chaperones at each event.
- Establish a rotation of Youth Commissioners at each event.
- Require multiple Youth Commissioners to pass the Certification for Crowd Manager so that Youth Commissioners are interchangeable.
- Establish a protocol for nominating and selecting Youth Commissioners and determining years and terms of service.
- Form a Student Youth Commission so that ideas and enthusiasm for events come straight from the students.
- Nominate and approve Advisors for the Student Youth Commission.
- Plan monthly meetings for the Student Youth Commission.
- Establish checklists and protocols so that any member of the Youth Commission can oversee an FNL event successfully.

## Section 10: Public Comments and Letters of Approval



*A view along the Twin Peaks Trail on the Benfield Hill property owned by the Carlisle Conservation Foundation. Benfield Hill is one of the highest spots in Carlisle and served as an informal ski hill in the 1960s. The trail loops around a large vernal pool nestled in a hemlock grove and past some large granite outcroppings.*

## Section 10: Public Comments and Letters of Approval

In early 2021, the public and all the boards and committees whose input had been solicited for the updated Action Plan were invited to review and provide input to the Committee on the draft 2020/2021 Open Space and Recreation Plan (OS&RP), posted online on the Town website. A notice was also placed in the *Carlisle Mosquito* requesting feedback. A link to the draft was also shared with the Metropolitan Area Planning Council (MAPC) and the Division of Conservation Services (DCS).

DCS requires that all open space plans be reviewed by the applicable regional planning agency. In its letter of March 16, 2021, summarizing its review, MAPC reported that the OS&RP includes initiatives to help advance the goals and objectives of *MetroFuture*, the regional policy plan for the Boston metropolitan area. Also in March, the OS&RP received conditional approval from DCS through March 2028—the conditions requiring some additions and edits to the draft plan and the submission of additional materials to DCS including the completed ADA Self-Evaluation forms.

Input was received from several boards and committees, including some requests for corrections to a few facts and figures. Feedback was also received from numerous citizens, several of whom provided detailed comments running to multiple pages. Comments were quite positive: “Wonderfully done. It’s such a pleasure to read something so cogent, so well written, and organized.” “[A] great read.....everything you always wanted to know about Carlisle, and then some.” “Many thanks to the OS&RP Committee for all your hard work completing this draft plan. The Plan is well written and contains a wealth of valuable information and recommendations.”

The Committee made the necessary revisions to address the conditions in the conditional approval from DCS and incorporated the input received from town entities and members of the public, as appropriate, into a final plan, which was submitted in May 2021, to DCS and Carlisle’s Select Board, Planning Board, Conservation Commission, and Recreation Commission for formal letters of approval. The approval letters follow.



*The Commonwealth of Massachusetts*  
*Executive Office of Energy and Environmental Affairs*  
*100 Cambridge Street, Suite 900*  
*Boston, MA 02114*

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May 7, 2021

Sylvia Willard  
Conservation Commission  
66 Westford Street  
Carlisle, MA 01741

Re: Open Space and Recreation Plan

Dear Ms. Willard:

Thank you for submitting the Open Space and Recreation Plan for Carlisle to this office for review and compliance with the current Open Space and Recreation Plan Requirements. I'm pleased to write that the plan has received final approval and the town is eligible to apply for DCS grants through March 2028. Please contact me [melissa.cryan@mass.gov](mailto:melissa.cryan@mass.gov) if you have any questions or concerns.

Sincerely,

*Melissa Cryan*

Melissa Cryan  
Grant Programs Supervisor



SMART GROWTH AND REGIONAL COLLABORATION

March 16, 2021

Melissa Cryan  
Executive Office of Energy and Environmental Affairs  
100 Cambridge St. – Suite 900  
Boston, MA 02114

Dear Ms. Cryan:

The Town of Carlisle's "Open Space and Recreation Plan 2020" was recently submitted to the Metropolitan Area Planning Council (MAPC) for review.

The Division of Conservation Services (DCS) requires that all open space plans must be reviewed by the applicable regional planning agency. This review is advisory and only DCS has the power to approve a municipal open space plan. While your office reviews open space plans for compliance with your guidelines, MAPC reviews these plans for their attention to regional issues generally and more specifically for consistency with *MetroFuture*, the regional policy plan for the Boston metropolitan area.

**Consistency with *MetroFuture*** - *MetroFuture* is the official regional plan for Greater Boston, adopted in 2008 in accordance with the requirements of Massachusetts General Law. The plan includes 65 goals and objectives as well as 13 detailed implementation strategies for accomplishing these goals. We encourage all communities within the MAPC region to become familiar with the plan by visiting [www.mapc.org/get-involved/metrofuture-our-regional-plan](http://www.mapc.org/get-involved/metrofuture-our-regional-plan). (We also note that MAPC and its member communities are now in the process of developing a new regional plan, which will look out to 2050, and is accordingly called *MetroCommon 2050*.)

We are pleased to see that the Carlisle Open Space and Recreation Plan (OSRP) will help to advance several *MetroFuture* goals and implementation strategies that relate specifically to encouraging land protection, addressing climate change, enhancing safer pedestrian pathways and trail networks, and promoting accessibility to regional resources. The plan includes a section on regional coordination and an assessment of key open space and recreational resources in surrounding communities.

**Surrounding communities** – The OSRP highlights regional open space resources including Great Brook Farm State Park, the Bruce Freeman Rail Trail, the Concord River, Great Meadows National Wildlife Refuge, Greater Estabrook Woods, Cranberry Bog Conservation Land, and connections that exist (or are being considered) with trail systems in adjacent municipalities.

The Carlisle Open Space and Recreation Plan provides a great deal of specifics regarding its parks and open spaces, which includes an assessment of their current condition and future needs. The open space and recreational resource inventory maps are particularly detailed, as is the Action Plan map. It should serve the Town well as it continues its efforts to preserve open space and provide for the recreational needs of its residents.



SMART GROWTH AND REGIONAL COLLABORATION

Thank you for the opportunity to review this plan.

Sincerely,

Ralph Willmer, FAICP  
Technical Assistance Program Manager and Principal Planner

cc: Sylvia Willard, Administrator  
David Freedman, Chair, Open Space and Recreation Plan Committee



*Town of Carlisle*  
Office of  
SELECT BOARD  
66 Westford Street  
Carlisle, Massachusetts 01741  
Phone: (978) 369-6136

May 26, 2021

To Whom It May Concern:

The Carlisle Select Board, at their May 25, 2021 meeting, voted unanimously to approve the Year 2021 update of the Carlisle Open Space and Recreation Plan. The Board reviewed the Plan and found it very complete and well written. The plan accurately represents the views of the Board and Town residents with respect to the continued preservation of our open space and rural character.

The Board continues to work with our various boards and departments to provide both passive and active recreation to meet the need of our residents. The Carlisle Open Space and Recreation Plan is an invaluable source of information and guide that aids us in this endeavor.

Sincerely,

Alan L. Lewis,  
Carlisle Select Board



# Town of Carlisle

MASSACHUSETTS 01741

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Office of  
**PLANNING BOARD**

66 Westford Street  
Carlisle, Massachusetts 01741  
Tel. (978) 369-9702  
Fax (978) 369-4521  
E-mail: [planning@carlislema.gov](mailto:planning@carlislema.gov)

May 25, 2021

Mr. David Freedman, Chair  
2020 Open Space and Recreation Plan Committee  
301 Hutchins Rd  
Carlisle, MA 01741

Dear Mr. Freedman,

On May 24, 2021, the Carlisle Planning Board reviewed the final 2020/2021 Open Space and Recreation Plan, dated November 1, 2020, and endorsed that plan by a vote of 7-0. The Board looks forward to utilizing this updated plan as a resource and guide in the land development and preservation decisions that it is required to make regularly, and in the Master Plan Steering Committee's development of the Carlisle Master Plan.

The Board and I also wish to express our sincere appreciation and thanks for the work you and your Committee members undertook continuously over the past year to develop this plan, which will enhance the experience of those living and working in Carlisle for years to come.

Sincerely,

Madeleine Blake  
Planning Board Co-Chair

Cc: Sylvia Willard, Conservation Commission Administrator  
Planning Board



**Town of Carlisle**  
*Office of*  
**CONSERVATION COMMISSION**  
66 Westford Street  
Carlisle, Massachusetts 01741

Tel. (978) 369-0336  
Fax: (978) 369-4521

May 28, 2021

Mr. David Freedman, Chair  
2020/2021 Open Space and Recreation Plan Committee  
301 Hutchins Road  
Carlisle, MA 01741

RE: Carlisle Conservation Commission Endorsement of the 2020/2021 Open Space and Recreation Plan

Dear Mr. Freedman,

The Carlisle Conservation Commission has reviewed and accepted with enthusiasm the updated Open Space and Recreation Plan submitted by your committee.

The Commission congratulates and thanks you for your hard work and diligence in creating a plan that is truly reflective of the present status of Carlisle's open space and recreation programs. The report also creates a vision for the future that the Conservation Commission will use as Carlisle moves forward during the next several years. The citizens of Carlisle will benefit greatly from the work of you and your committee.

Sincerely,

Lee Tatistcheff, Chair  
Carlisle Conservation Commission





[www.carlislema.gov](http://www.carlislema.gov)

**Town of Carlisle**  
*Office of*  
**RECREATION DEPARTMENT**  
66 WESTFORD STREET  
CARLISLE, MASSACHUSETTS 01741  
Telephone: 978-369-9815



Fax: 978-371-6686

Open Space & Recreation Plan Committee  
Town of Carlisle  
May 25, 2021

To Whom It May Concern:

On May 17, 2021, the Carlisle Recreation Commission voted to unanimously approve the 2020/2021 Carlisle Open Space & Recreation Plan.

We extend our thanks to the Committee for its hard work in creating a plan that accurately presents the programs and facilities offered by the Recreation Commission as well as the current status, future needs and vision for recreation facilities in Carlisle.

Sincerely

Drew McMorrow  
Chairman